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ST. LOUIS CHRONIC HOSPITAL PROGRAM

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Reorganization of an overcrowded hospital reduced the census from 1,535 patients to 1,458 and eliminated a waiting list of 700 patient applicants. It is recognized that the citizen who survives into the later years generally becomes an institutionalized or totally dependent person, but it is in the proper and pleasant use of these waning years that modern society is most remiss. Permanent confinement, when preventable or premature, is morally unjust and economically wasteful. Nearly every large community offers auxiliary services that can aid the physician to prevent or postpone such confinement. Adult recreational centers especially can be used to detect the first signs of physical disability and desocializing tendencies in the old people for whom the centers are intended. Rehabilitation for the aged needs redefinition, since few can be restored to gainful employment; for most, the goal must be maintenance activity to prevent deterioration. Programs of physical and occupational therapy often uncover deep and profitable interests in patients who seemed hopelessly senile. The nursing home physician should realize that his responsibility extends beyond diagnosis and treatment into the area of total care for the individual.

This paper is a progress report on the approach of the St. Louis Chronic Hospital toward a solution of the municipal problem of aging and chronic illness in the city of St. Louis. In the course of the presentation we have expressed our developing [illegible]sions, not only with regard to the immediate practical handling of the problem but also with regard to the role practicing physicians should undertake, both individually and through medical societies, to service this large, medically dependent segment of the population.

History

The St. Louis Chronic Hospital had its origin in about 1848. It was then known as the St. Louis County Poor Farm, and its purpose was "to provide a home for the infirm poor of the city of St. Louis and St. Louis County." The buildings were built between 1855 and 1885. On April 1, 1910, the name of the institution was changed to the St. Louis City Infirmary. In 1945, the St. Louis Isolation Hospital was merged with the St. Louis City Infirmary, and since 1953 it has been called the St. Louis Chronic Hospital.

On April 1, 1945, there was a total of 988 patients. One year later there was a total of 1,270 patients. Ten years later, on April 1, 1955, there was a total of 1,521 patients, and there was also a

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waiting list of about 700 patients, the oldest application dating back to 1949. Briefly, these figures reveal the trend of the times and the mounting problem of care of the aged and chronically ill in a passive custodial system. Prior to 1955, the St. Louis Chronic Hospital was a purely custodial, steadily expanding institution. Services were limited to emergency medical care. A reorganization was initiated in March, 1955. Generally speaking, in reorganization programs cost features are ignored, but this program has been undertaken with only moderate increase in cost. The 1956-1957 per diem expenditures of this hospital were $4.18, as compared with the 1954-1955 per diem expenditures of $3.55. Anticipated 1957-1958 per diem expenditures may run slightly higher.

As a result of this reorganization and change in program, described later in this paper, the waiting list of 700 patient applicants has been eliminated. The hospital census has been reduced from a greatly overcrowded number of 1,535 patients in February, 1955, to a still overcrowded number of 1,458 on Aug. 30, 1957. In addition to the inpatient population, there are approximately 115 patients maintained outside the hospital through the outpatient program of combined home care and clinic care.

Basic Philosophy of the Chronic Illness Program

The establishment of a program to service the aged and chronically ill must be based on a definite policy that can extend from the critically ill divisions of a chronic hospital to the recreational aspects of preventive medicine. After due consideration, the following policy was formulated to supply the active principle of the St. Louis Chronic Hospital program: 1. The St. Louis Chronic Hospital is designed for chronically ill citizens, incapable of affording comparable private facilities, who require institutional care. 2. The solution of the chronic illness problem lies on the family level and not in a massive public institution program, but where costs limit private care a proportional share of responsibility for combined home and clinic care must rest with the chronic hospital.

Actual permanent institutionalization should be the last point of recourse for individuals previously filtered out by a system of scientific rehabilitation and preventive medical techniques. The organization of such a broad program has many social implications, and, although starting far from the hospital wards, every step is designed to "defer" the permanent institutionalization of the individual. The term "defer" is used in recognition of the basic fact that the aging years of our population represent a downhill course and that, in the light of present conditions, the citizen who survives the vicissitudes of life to the later years will, with rare exceptions, become an institutionalized or totally dependent person. It is in the proper and pleasant use of these waning years that modern society is most remiss. The further development of this principle that every person will eventually become a dependent responsibility and represent a potentia institutional patient means that the point of actua permanent institutionalization is the critical factor in the solution of this problem.

The St. Louis Chronic Hospital's current admission studies reveal a 29% mortality within the first six months and a 48% mortality within the first two years. If the surviving 52% admitted population could have been deferred through adequate care in their previous circumstances, the solution to the problem of ever-expanding institutions would become obvious. Therefore, complete concentration of effort must be placed on rehabilitating this class of patients until such time as they show irreversible evidence of degeneration and inability to function in open society. The moral injustice and economic waste of premature preventable permanent confinement does not require comment.

The development of a program devoted to the deferring of institutionalization depends on communitywide acceptance. The keystone for an aggressive approach to the maintenance of the aged and the chronically ill in the home environment is the family physician. Unfortunately, the family physician is limited in his ability to render comprehensive therapy in the home-care area.

Home Care as a Medical Responsibility

Home care means utilization by the physician of the full scope of auxiliary services required for feasible complete therapy. Nearly every large community offers a number of auxiliary services which can aid the physician in this effort to combat chronic illness and the problems of aging. These services have been developing slowly and [illegible] been largely unnoted by the majority of practicing physicians.

Families faced with difficult situations are willing to adjust and to offer great sacrifices for loved ones, but they cannot be expected to originate a system of nursing, diet, occupational therapy, physical therapy, and housekeeping practices. The family needs home-care services properly oriented by organized medicine and encouraged by practicing physicians. We respectfully suggest that the development of these auxiliary services should be a function of the community's medical societies, because it is the proper utilization and direction of these services by the practicing physician that will mean success of the independent approach to the solution of the problems of aging persons and chronic illness.

We believe that it is a leadership function of organized medicine to participate in these areas of direct patient service in an effort to keep the patient in the family environment and in a more or less active role in the community. In many areas, this leadership function will involve the direct establishment of presently unavailable facilities;

in other areas, participation in expansion and utilization of current efforts may be the role of the medical society. But in all these fields of practical home-care medicine, the medical society has a vital role to support ideals based on the family unit and family responsibilities. We therefore believe that the family physician, in developing and using community medical auxiliary resources, represents the key factor for the American solution to the ever-growing problem of aging and chronic illness in our society.

Application of Preventive Medicine to the Aged

In accord with the effort to keep the individual in the community, the first contact of the elements dealing with the aged is the adult "recreational" center. Fortunately, the original unit of the St. Louis Senior Citizens groups is located in the St. Louis Chronic Hospital area. The St. Louis Senior Citizens is a nonprofit corporation that has utilized the facilities of the St. Louis Chronic Hospital for a number of years, thereby enabling approximately 300 persons, above the age of 50, to attend volunteer recreational activities. The vast majority of these senior citizens have never been a municipal responsibility. They represent a typical aging population of any area and present no medical-social problem or responsibility to the municipality.

Under the previous program, the Senior Citizens Center was recreational in nature. When studied by professional personnel, it was seen that the original program was working in reverse, with the ill and needy being eliminated. Those who could find their entertainment from a multitude of other sources were taking over the programs. This anomaly highlighted the need for medical orientation of a problem that has a basic medical foundation. Hence, under the present program, the activities are directed by the more active senior citizens and the entire operation, from a purely recreational standpoint, is being developed to function from within itself. It is primarily in the detection of individuals requiring therapeutic aid that the professional staff is utilized.

The most important function of the adult recreational center is the early detection of the physical disabilities and the desocialization tendencies of the aging individual. Consequently, greater stress is laid not on the successful senior citizen members but on those who do not appear to adapt to the program. This small percentage should be the main focal objective of the professional staff in an adult recreational program, as this small group, in failing to adapt, represents the patients in immediate need of help. Techniques to detect these individuals are being studied. The chronic hospital assumes no direct medical responsibility for any phase of this program, and referral of these individuals is made to their family physicians.

The day hospital program of the St. Louis Chronic Hospital operates to prevent institutionalization of individuals who are a municipal responsibility. These people are referred from local clinics, they are among the rehabilitated discharges, or they are the applicants deferred by the admission department. These people are not distinguished from the regular senior citizen groups, and only insofar as they represent a medical responsibility of the city or local clinics are they given medical treatment. This group is periodically observed, and every effort is made to sustain them in their present community environment for an indefinite period of time.

Hospital Admission for Chronic Illness

A large number of the aging citizens of our community have an appalling lack of knowledge of the available resources. Furthermore, a lack of an adequate municipal center results in a great deal of needless distress and even physical deterioration when available facilities are not utilized. Therefore, the St. Louis Chronic Hospital found it necessary to establish an information center. Many are simple telephone referrals, but direct counseling interviews are given as needed at an increasing rate.

The admission service is one of the most important phases of chronic hospital care. In the past, the institutionalization of the chronically ill or aged, in many instances, represented a life sentence. Every patient is now admitted with the emphasis placed on the need for hospitalization. Equal emphasis is placed on the fact that the patient will be discharged or transferred to another facility when it is determined that his needs could be met equally or better in another facility. To accomplish this, a full study is initiated at the time of application. A medical-social worker and a physician oriented to chronic illness interview these applicants. The result of these findings is made the basis for admission.

The development of the admission service has resulted in the admission of 55% of the total initial applicants. Those not admitted were not summarily dismissed from consideration, but each represented an individual problem with an individual solution which was carried through to satisfactory completion by the medical and social work staff. Of this latter group, 12% are now currently in the clinic and home care program and are seen at varying intervals, depending on their condition.

Chronic Illness Institutional Medical Organization

Adequate reorganization of an institution with more than 1,500 patients with undetermined medical needs presented a challenging problem, particularly when undertaken in the face of limited budgetary allowance, with an existing staff of largely nonprofessional nursing personnel, and in the absence of trained auxiliary personnel. The pilot project approach was seriously considered, but the critical need of a great mass of patients and the practical reality of the many future decisions required for the implementation of a successful pilot project forced a broader approach. Accordingly, an over-all plan was developed, so that every individual phase could be reinforced and developed as personnel became available.

Due to limited budgetary allowance, every step had to be considered with extreme economy of personnel and equipment. However, medical records, library, radiology service, surgical service, dental service, dietetic service, occupational therapy, physical therapy, and social service departments were organized. Physicians selected from the staffs of local medical schools were enlisted in the effort to improve care. Because of the lack of accreditation, a modified house-officer system was established for nonspecialists, wherein their work was supervised by more qualified individuals.

The deterioration of the aged institutionalized individual is a challenging medical care problem. As physicians, we are aware of how important it is to detect all treatable disease and not to let the patient's age cloud diagnostic acuity, and in the older age group, because of the deteriorating influence of inactivity, satisfying the need for some expression of personal interest and encouragement may mean the difference in the patient's ability to regain physical and mental stature. To meet these needs, the patients were grouped into two major classes: 1. Those requiring special medical evaluation and therapy. The wards receiving them are cardiology, metabolism, neurology, oncology, intensive rehabilitation, and long-term rehabilitation. The specialty ward classification was intended to stimulate research and facilitate long-term treatment and observation. 2. Those requiring general medical evaluation and therapy, whereby care would be given in accordance with general medical needs.

The concept of limiting patients by degree of care to a specific area is generally carried out in most long-term institutions. In dealing with the problems of the aged, however, it assumes an important character. The needs of the individual vary considerably, not only in nursing hours but in the way these hours are applied to the patient. Patients with minimal mental and physical disability still require time for maintenance activity to prevent deterioration. A silent elderly person is not necessarily a contented patient or even a healthy patient.

The practical effect of varied needs in patient care in the same ward results in neglecting the majority of relatively well individuals in favor of giving needed care to the ill minority. This is particularly true in smaller institutions, and even larger institutions are administratively reluctant to fluctuate personnel in a local area according to medical demand. We therefore feel that, in spite of the objection to separation of the aged from their adopted home area, they will not suffer emotionally when they are moved from one well-run area or institution to another well-run area or institution which is able to give better individual care.

The division of the general medical wards reflects the pattern of disability in an institution of this type, and the medical cases are divided into five levels of care. In the care of a total of 783 medical patients, medicine 1 represents those capable of full self-care and independent ambulation and comprises 23%. Medicine 2 represents semiambulant patients with limited self-care, who are able to participate in rehabilitation activities, and comprises 28%. Medicine 3 represents ambulatory patients with various degrees of self-care who are mentally out of contact with reality, and comprises 20% of population. (The latter figure has been corrected to allow for Missouri State mental patients who do not form true municipal chronic illness responsibility.) Medicine 4 is essentially a bedridden area, with patients manifesting far-advanced physical and mental deterioration not responsive to long-term rehabilitation; it comprises 22%. Medicine 5 represents the seriously ill and has 7% of the total medical population.

For purposes of comparison of the effectiveness of the intensive outpatient home care and clinic program to control new patient admissions, the medical disposition of the June, 1957, admissions revealed no placement on medicine 1 and medicine 2, 15% on medicine 3, 15% on medicine 4, and 20% on medicine 5. Rehabilitation 1 received 7% of the June admissions, and 15% went to rehabilitation 2. Metabolism, cardiology, oncology, and neurology accounted for the remaining 22%.

Rehabilitation in Chronic Illness

The function of a chronic hospital is to fill the gap in the management of an illness which is not fulfilled by either the active general hospital or the home care program. The general hospitals cannot tie up their beds with prolonged hospitalization of chronically ill patients, and home care is difficult unless patient and family have been trained and assisted to the level where the patient can be managed effectively.

Rehabilitation, which is a major function of the chronic hospital for the aged, is considerably different from the generally understood concept. Most of the patients, even if perfectly well, would not be gainfully employed. Of 576 patients whose cases were analyzed, only 2 were felt qualified to be considered for gainful employment. Therefore, rehabilitation has been directed largely toward increasing their mental and physical abilities and maintaining their current faculties, so that the patients can live as closely as possible to normalcy with their disabilities. Rehabilitation in the aged may be fluctuated but should never be terminated except by dissolution or discharge. The many physical and emotional benefits of reestablishment of contact and the effects of this program on the abilities of the individual are not discussed in this paper but will be covered in a later report.

Rehabilitation has been established on three levels, depending on the decisions and recommendations of the rehabilitation board or the physician. They are as follows: 1. Intensive rehabilitation. This phase is decided on by the physician when a patient is found to have excellent discharge potentialities from the standpoint of motivation, physical impairment, and economics. In this area, intensive concentration is devoted to the individual to fulfill correction of the specific deficiencies preventing his return to society. This is the type of program found in general hospitals. 2. Long-term rehabilitation. This phase represents a larger ward area with many more patients and is devoted to a concentrated prolonged effort (up to 18 months) to bring the individual to a higher plane of activity. The objective of this ward is to obtain the maximum rehabilitation plane possible in the individual under therapy. The full scope of medical, dietary, physical, and occupational therapy departments is utilized. This type of program is the major function of a chronic hospital. 3. Maintenance rehabilitation. This third phase is one which we feel is the most neglected in long-term institutions. The objective of maintenance rehabilitation is simple. It is primarily designed to prevent the hitherto almost inevitable deterioration that accompanies the sedentary life of the confined individual. Maintenance rehabilitation ranges from the ward detail work and various recreational and creative activities of occupational therapy to the daily active or passive exercises of physical therapy. This type of program is important in the family, the nursing home, and the supervised boarding home or foster home.

Maintenance rehabilitation is used to prevent regression and to detect those people manifesting a tendency or a desire for improvement. This type of rehabilitation is as important in the long-term institutionalized patient as any other service in its over-all effect on the individual. Maintenance rehabilitation is the medically oriented link that spells the difference in some areas between work and play, between therapy and recreation. It is the aspect of aging programs that ties the aging individual in the recreational center to the physiological-psychological therapeutics of modern rehabilitation. The development of this concept of the aged and its acceptance and utilization by physicians will serve to clear the confusion found among many lay groups in their establishment of recreational programs for the aged.

Many aged persons have an existence completely confined to the bedside chair and table and an occasional trip to the bathroom. The world has closed in about them, until they appear, to the observer, to be completely hopeless. Rehabilitation teams surveying these institutions frequently arrive at a low percentage of potential rehabilitation prospects. This is partly due to the resignation and the justifiable cynicism of the patients themselves.

At the onset of this rehabilitation program, we submitted a written questionnaire to more than 1,000 patients and received less than 10 replies. Fortunately, we did not use this response as a true picture of the needs of the patients. The occupational and physical therapy programs in unselected wards, excluding the ward for seriously ill patients, have received a participation of 770 out of 1,100 patients. Occupational therapy alone has 700 patients under treatment, and interest is intense, with complaints from previously withdrawn, docile patients if for some reason the shops are closed early or opened late. Apparently as a result of group therapy effect, many deep and profitable interests have been uncovered in these patients who seemed so hopelessly senile.

The rehabilitation wards represent 7.9% of the total patient population. Interestingly enough, with 106 patients only 0.9% of the beds are necessary for intensive rehabilitation therapy, and frequently these beds are unoccupied due to the difficulty in finding likely candidates for this type of therapy. On the other hand, the long-term rehabilitation ward with its different objective represents 7% of the total bed supply, or 94 patients. The demand for this area always exceeds the bed supply.

Total Care of the Patient

To insure inflexible reconsideration of the total patient, the rehabilitation board was established. The board is composed of physicians, nurses, and representatives of physical therapy, occupational therapy, and the medical-social work departments.

At this point, an additional reason for periodic reevaluation by impartial sources should be mentioned. Often the consideration of the patient's status lies solely in the province of the ward physicians or possibly of a visiting physician whose attention is frequently directed by the nursing personnel to the acutely ill. In such a situation, the lives of the patients are controlled by the attendant and nursing personnel. The patient-personnel relationship in long-term institutional care, where professional external supervision does not take place, can degenerate into an autocratic dictatorship beneath a docile, placid exterior. The visiting physician may be unable to alter or even detect this relationship.

The members of the board interview, examine, and test each patient before the board meetings. The patients become aware of this, and at times the patient's response is surprisingly intense. At the conclusion of the board discussion, recommendations are made, a current diagnosis is given, with the primary problem in the patient's management emphasized, and a functional classification is made. The conclusion represents the consensus of opinion of the board members.

Since management of chronic illness rests primarily in assisting patients and their families to live with the residual disease and resulting disability, a functional representation of the abilities of the patient becomes important. The following classification represents a simple and modified form of the activity of daily living. This classification helps to determine which medical ward is best suited for the patient, and it also gives a method of measuring the progress of the patient's condition: 1. Mental status within normal. 1A. Mild confusion—emotionally unstable but felt to be competent. 2. Control of bladder and bowel. 3. Self-feeding. 4. Self-clothing. 5. Self-bathing in bathtub. 6. Ability to use toilet without help. 7. Taking part in ward activities, such as occupational therapy, minor detail, and socialization. A. Ambulatory without aid. A1. Ambulatory with cane, crutch, or walker. B. Bedridden. C. Confined to bedside and chair. W. Confined to wheelchair—able to get in and out of wheelchair unassisted. W1. Confined to wheelchair—unable to get in and out of wheelchair unassisted.

The definition of the breakdown of the medical wards is partly based on the above classification, and, accordingly, the proper medical ward can be determined after analysis of the patient's functional classification. This classification has proved to be extremely valuable in the over-all evaluation of the long-term rehabilitation program. Such a simple classification as listed here has provided an excellent measure of the patient's hospital course. This functional classification is reviewed and charted twice a year and is contained in routine progress notes.

Patient Requirements and Disposition

As revealed in the introduction of this paper, there were too many patients in the St. Louis Chronic Hospital for an already overcrowded institution. The previous methods of steadily increasing the bed capacity of the municipal institutions were not meeting the need. To be able to visualize the various areas where effort had been lacking in meeting this problem of aging and chronic illness in the city of St. Louis, a classification was established to emphasize the facilities required by the currently hospitalized group of patients and to point out the reasons why the appropriate facility was or was not utilized.

The following outlines throw some light on these two facets of the problem: First, the facility needed by the patient may be (1) independent living, (2) boarding home, (3) supervised boarding home, foster home, or family environment, (4) nursing home, or (5) hospital. Second, the disposition may be (1) lack of finances, (2) discharge detrimental for medical reasons, (3) discharge, (4) no facility available in the community, (5) under study, or (6) discharge detrimental for emotional reasons.

It is of interest to note that in preliminary studies of 339 patients newly surveyed, none were capable of independent living; 1% were capable of living in a boarding home more or less on their own; 10% were capable of living in a supervised boarding home or foster home where their diet and habits were observed; 38% required assistance in a nursing home; and 51% required chronic hospital-type care. The initial conference findings with regard to the above 339 patients' disposition indicated that, in accordance with the sources of revenue available in the state of Missouri, 45% were maintained in the city institution primarily because of inadequate finances; 3% were discharged; 14% were maintained in the hospital primarily for medical-money reasons; and 2% were maintained in the hospital primarily because the extremely long period of institutionalization made them emotionally incapable of being rehabilitated at that time. Two per cent were maintained in the hospital because no facilities were available for the type of care needed, and 34% were maintained under study. This large group contained patients for whom additional information or treatment was required to arrive at an analysis of disposition. Detailed analysis of the rehabilitation conferences with regard to a large number of indigent hospitalized patients, admitted under gradually increasing stringent admission regulations, will be made the subject of a comprehensive subsequent report.

Comment

The information gathered in the foregoing procedures, as accumulated over a period of time, presented confirmation of our working hypothesis with regard to the problem of aging and chronic illness. The developing aging and chronic illness problem has two alternatives for solution: 1. A cultural pattern of acceptance of aging and disability by the family as a social responsibility of the family unit. 2. A system of massive institutionalization whereby aging and ill persons are made wards of the state.

Today, the majority of care is rendered by the family along the cultural patterns of family responsibility, but there is a strong tendency toward the assumption of responsibility by the state. The pattern of American development along this line can be most profoundly influenced by the family physician. His role in this development is not only to encourage the assumption of family responsibility but to aid and participate in the development of the home care necessary for the best total medical need of the patient.

The application of these techniques to the smaller institution and the nursing home would not seem to be impractical if these institutions are taken as a group, whereby each nursing home facility limits its activities to a specific classification, with exchange of patients as indicated. Here again the role of the physician, through his medical society, in insisting upon adequate medical care for his patients is paramount.

In his present role, the nursing-home physician is limited in his ability to determine the type of patients admitted to his facilities. We believe that the local medical society could reinforce the nursing-home physician by a modified system of rating and accreditation. The nursing home physician should realize that his responsibility goes beyond diagnosing and treatment and into the area of total care for the individual. The concept of permanently relegating an individual to a nursing home should be modified or altered, with emphasis on long-term and maintenance rehabilitation carried on without regard to the element of time to effect correction of the precipitating admission factors and to restore the individual to open society. By working along these lines, the physician may encourage the best medical care in the proper cultural pattern of individual freedom and responsibility and, only incidentally, bring about the most feasible economic solution of the problem of aging and chronically ill persons.

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FOLLOW-UP STUDIES IN CHEMOPALLIDECTOMY FOR PARALYSIS AGITANS

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The effectiveness of chemopallidectomy in the treatment of paralysis agitans was investigated in a group of 141 patients who had undergone the operation not less than six months before; 106 of these patients returned a questionnaire designed to contrast their preoperative with their postoperative status as to local symptoms and daily activities. The results were compared with data similarly obtained from 103 out of 173 patients who had had the same symptoms initially but had not undergone operation. The operation consisted in producing a chemical lesion in either the globus pallidus or the ventrolateral nucleus of the thalamus by injecting alcohol of a like substance. Distinct relief of the tremor and rigidity on the affected side (contralateral to the lesion) was found in 93 of the patients operated on, while only 9 of those not operated on reported improvement during the same interval of time. The former group became less dependent on assistance in daily self-care activities, and some were able to take up or resume useful occupations; the latter group showed marked deterioration with respect to self-care and useful occupation. The beneficial effect of the operation upon the patient's capacity for independent activity is illustrated by three case histories.

This investigation concerns a follow-up study of the effects of a new neurosurgical procedure for paralysis agitans (Parkinson's disease) which has been developed during a continuing investigation over the past five years. An initial technique, known as anterior choroidal artery occlusion, was carried out in about 50 patients, with improvement of the symptoms in about 70% of the group.[1] In 1953, a second procedure, known as chemopallidectomy, was developed, and to date about 600 operations of this type have been carried out. Cooper has reported on the technique and results of this surgery on several occasions during the past three years.[2] The operation has been found to be capable of relieving tremor and rigidiy in about 80% of the patients, properly selected. The complications to date have consisted of a mortality rate of 2.8%, an incidence of hemiplegia of 2%, and transient mental confusion or emotional distress in about 10% of the cases. In studies carried out by independent investigators [3] these findings were verified.

Briefly, chemopallidectomy consists of injection of alcohol or a similar substance into the globus pallidus and, in some cases, the ventrolateral nucleus of the thalamus, thus creating a chemical lesion in their structure. When successful, this has been found to relieve both tremor and rigidity on the side of the body contralateral to the side of the brain lesion.

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For some time, a team of professional rehabilitation workers has been working closely with the neurosurgeons in order to develop methods of selecting appropriate patients for the surgery and objective means of immediate postoperative evaluation of the patients.[4] In all cases, patients receive an intensive battery of medical, psychological, and motor tests before and after surgery so as to form a base-line for accurate evaluation of results. In addition, wherever possible, patients are asked to return to the hospital after operation for follow-up visits on a regular basis, and a number of patients have thus been followed by a rehabilitation team for up to three years. However, since many of the patients who undergo surgery come from widely separated areas of the United States, it has been impossible from the practical point of view to see all of them for follow-up examinations. Therefore, questionnaires mailed to these patients have been utilized in order to obtain detailed information in regard to their long-range status.[5] In a continuing and expanded program of follow-up studies of this nature, we mailed questionnaires to a large group of patients who had been operated on and to a control group of patients with paralysis agitans seen for evaluation during the same sequence of time but not subsequently operated on. It is the purpose of this report to present in detailed form the material secured from these questionnaires. (All of the completed questionnaires are filed in the investigative archives of St. Barnabas Hospital and may be referred to by investigators seeking verification of the subsequent data presented in this report.)

Procedure

In order to carry out an adequately controlled long-range follow-up study, four separate but equivalent sets of questionnaires were prepared, one set each for male and female patients who had been operated on and one set each for male and female control patients. For the surgical group, questionnaires were sent to 141 consecutive patients and returned by 106, or 75% of the group. For the control group, questionnaires were sent to 173 patients who were seen for evaluation during the same period of time but not subsequently operated upon. Returns were received from 103, or 60% of that group. Twenty questionnaires were returned undelivered; the family had moved, or our records had only a temporary address.

For the patients who had been operated on, the mean time elapsed between initial evaluation and receipt of questionnaire was 11.3 months, with a range of 6 months to 2 years and 4 months. For the control group, the mean time was 14.5 months, with a range of 6 months to 2 years and 4 months. Thus, although the ranges for both groups are identical, for the control group the mean time elapsed was about three months longer than that for the group operated on. No questionnaires were sent to patients if at least six months had not elapsed, inasmuch as this amount of time is required to gauge any changes in the areas under consideration.

In regard to the control group, it should be noted that these patients were all seen for preoperative evaluation as possible candidates for surgery during the same sequence of time as was the operated group. However, they did not undergo surgery either due to their own choice or because they were not felt to be suitable surgical candidates by the evaluation team. This group was selected as a control group, inasmuch as they generally were followed closely with medical and drug therapy or rehabilitation. Thus, in general, they had the benefit of all anti-Parkinsonism therapies except neurosurgery.

The items in the questionnaires were based to a degree on changes observed in the patients who had been operated on during the weeks immediately subsequent to surgery. In addition, subjective statements made by patients were organized and integrated into the questionnaire. Attempts were made to phrase the questions in a simple, unambiguous manner, and questions were so chosen as to be grossly applicable to the entire group and capable of being answered by either the patient or a member of his family. Four broad areas were covered: symptoms, daily activities, over-all impairment, and vocational factors. In general, the questionnaires were oriented toward the over-all situation of the patient rather than the symptoms alone. This was done so as to provide a broader basis for the evaluation of the patient and thus permitted the patient and his family to use their own judgments concerning total changes in their situation over the period of time elapsed. In spite of known difficulties inherent in questionnaire studies of this type, it was felt that in general the same factors hold for the group operated on as for the control group, and thus these factors are equated.

Population of the Study

In order to secure uniform descriptive information in regard to the patients in both groups when seen for initial evaluation, all patients were requested to provide data concerning age, education, and length of illness. In regard to educational achievements, the groups were found to be essentially equivalent, the average schooling for the patients operated on being 11.6 years and the average for the patients not operated on being 11.1 years. The range of length of illness for all patients operated on was from 2 to 37 years, with a mean of 10.3 years, and for the control group it ranged from 2 to 35 years, with a mean of 12.1 years. It should be noted at this point that not all the patients answered all of the questions on the various questionnaires, and the results are based only on those patients who responded to the particular questions under consideration at that time.

The one essential difference in basic life data between the two groups concerns the mean age for the male patients: patients in the control group were an average of 10.5 years older than those in the group operated on. This difference, also reflected in the slightly longer length of illness discussed above, is due to several factors. In general, a major contraindication to surgery is age, because it is felt that patients over 60 years of age frequently present poorer surgical risks due not only to their age but also to impairments of both a psychological and a medical nature. In spite of this difference in mean age for the two groups, they were found to be equivalent in all other factors pertaining to the primary symptoms of the illness. For both groups, the vast majority of the patients demonstrated involvement on both sides of their bodies and a high proportion indicated that they suffered from tremor, rigidity, and slowness, 84% reporting this in the group operated on and 83% in the control group. In addition, 88% of the control group reported needing at least some assistance in daily activities, and 87% of the patients who had undergone surgery reported similarly. It is evident that in both groups under consideration were long-term patients who, in general, had a rather severe form of the illness.

In regard to the vocational status of the male patients, it was found that a significant proportion of both groups had been unemployed from 1 to 10 years or more. In the group operated on, about 50% of the males were working when seen for initial evaluation, and, in the group not operated on, about 45% were employed. The vast majority of patients in both groups reported that their income had been negatively affected as a result of the illness. The reasons given for this by the patients usually related to the symptoms of tremor and rigidity and the accompanying difficulty in traveling and carrying out other daily activities. A small proportion, however, reported such psychological factors as "embarrassment," "could not concentrate," and "nervousness" as contributing factors. It is thus clear that paralysis agitans has served to interfere significantly with the vocational status of patients in both groups.

In summary, the first part of the questionnaires sent out to each of the groups concerned itself with information pertaining to the patients' over-all situations at the time of the initial evaluation. Special reference was given to symptoms, activities of daily living, vocational status, and over-all adjustment. An analysis of responses from the questionnaires points to the essential similarity between the two groups in regard to social, educational, and vocational background, length of illness, severity of symptoms, and general incapacitation. The only significant difference between the groups was in terms of age, the male patients not operated on averaging 10 years older than the male patients operated on. This is due primarily to the factor of selection of patients, wherein patients in the sixth and seventh decades of life are frequently not considered for surgery either on the basis of age or because of other impairments of a psychological and medical nature which complicate the disease picture. It is evident, however, that we are dealing in both cases with severely incapacitated patients whose Parkinsonism has interfered with all aspects of their functioning.

Results

The second section of the questionnaires sent to all patients was concerned with data pertaining to the patient's situation at the time he received the questionnaire. In table 1 are summarized the responses in regard to the long-range status of tremor and rigidity for both groups. All patients were requested to state whether symptoms were better, the same, or worse at the time of receiving the questionnaire, as compared with status when seen for initial evaluation. For the patients who had been operated on, a division was made between the sides of the body, inasmuch as the surgery itself is directed to aid the side of the body contralateral to the site of the lesion. For the medically followed group, the question in regard to symptoms referred to the over-all condition, including both sides of the body.

TABLE 1.–*Follow-up Status: Condition of Tremor and Rigidity Compared with Initial Findings*

	Patients Operated On (105)				Control Group (93)	
	Side Affected by Operation		Other Side		Over-all Condition	
	No.	%	No.	%	No.	%
Better	93	88	28	27	9	10
Same	7	7	34	32	31	33
Worse	5	5	43	41	53	57

A review of the data presented in table 1 immediately reveals certain differences in regard to the status of tremor and rigidity when the two groups are compared. In regard to the side of the body for which operation was performed, about 88% of the group said that they were improved at least to some degree, while only 10% of the control group reported improvement. On the other hand, only 12% of the group operated on reported that their symptoms were the same or worse, while 90% of the control group reported that their over-all condition was worse or the same since first seen for evaluation. Of this group, the majority reported a worsening of the condition for their symptoms. It is of significance to note that for the group operated on 27% reported that the symptoms of their side opposite to that of operation were better, while 72% reported that their symptoms were the same or worse. This indicates clearly that while the illness itself progressed in the majority of the patients who received operations, the progression of the symptoms on the side affected by operation was halted. Indeed, this has been substantially improved for the most part when compared with the preoperative situation. In general, the above findings hold true for male as well as female patients and are not significantly related to age or length of illness.

For both the initial and long-range status, data were collected in regard to the patient's ability to carry out important daily activities. This included self-care activities for the male and housework for the female group. Table 2 summarizes the data in this regard for the long-range situation. In each case, the patient was asked to indicate whether he or she needed more, less, or the same amount of assistance in carrying out self-care or housework activities.

For the group operated on, 74% of the males reported that they needed less assistance in daily activities, whereas only 6% of those in the control group reported this. On the other hand, 11% of the males who were operated on reported needing more assistance, while almost 50% of those in the control group reported similarly. Thus, it is clear that for the group operated on improvement in the status of the symptoms for the side on which operation was performed was reflected in commensurate improvement in ability to carry out self-care activities. On the other hand, for the group not undergoing operation, the continuing progression of the symptoms has further interfered with their ability to care for themselves. In regard to ability to carry out household tasks for the female group, the data are less striking but still conclusive. In the group operated on, 55% reported that they needed less help in housework at the time of questioning, as compared to the time of initial evaluation, while only 6% of the control group reported this. In the group operated on, 12% reported that they needed more help, compared to 47% of the control group. It is interesting to note that about two-thirds of the patients reported that their status had changed for better or for worse in regard to the need for assistance, while only one-third reported no change.

In considering the total condition of a male patient, his vocational and occupational status is an important factor. For that reason, we collected data in both the preoperative and the long-range situation in regard to vocational functioning. For the group operated on, the total number of persons employed was found to be essentially the same as in the initial situation, while for the control group, seven less persons reported employment than previously, a drop of 22%. Thus, although the data are not conclusive in this regard, it would appear that, in general, the group who underwent operation maintained employment status, while the control group deteriorated in this regard. Table 3 is concerned with "ability to work," and this is a subjective consideration.

Table 2.— *Follow-up Status: Need for Assistance in Daily Self-Care Activities and Housework*

	Patients Operated On (95)				Control Group (84)			
	Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%
Need less aid	46	74	18	55	3	6	2	6
Need same aid	9	14	11	33	23	46	16	47
Need more aid	7	11	4	12	24	48	16	47

Table 3.—*Follow-up Status: Ability to Work Compared with with Initial Status*

	Patients Operated On (50)		Control Group (40)	
	No.	%	No	%
Better	28	56	3	8
Same	11	22	14	35
Worse	11	22	23	57

Over 50% of the patients who had undergone operation who responded to the question reported that they felt better able to work, while only about 8% of the control group reported this. Thus, while one's subjective feeling of being better able to work is not a sufficient condition for employment, certainly this contributes to a feeling of self-respect and motivation which may later be utilized in carrying out further rehabilitation procedures with the patient.

Report of Cases

Case 1.—A 39-year-old male, with an eight-year history of paralysis agitans on the right side, when seen for preoperative evaluation demonstrated marked tremor of his right upper extremity, rendering it useless for any functional activity. The patient had a high school education and in the ensuing years worked at various semiskilled jobs, his last being that of a coal miner. However, he had not been working for about five years because of his disease. The patient underwent a chemopallidectomy on the left side on Feb. 15, 1955, resulting in complete abolition of his tremor. Thereafter he was placed on a moderate program of rehabilitation which included intensive vocational counselling, evaluation, and guidance, which was necessary because of his long years of unemployment. Soon after he was able to secure a job as an aide in the physical therapy department in a hospital, where he was found to be a conscientious and industrious employee. He has continued in this work to the time of writing, and in a recent letter he reported that his health continues to be good, that he has had no return of symptoms, and that he frequently works several consecutive shifts.

Case 2.—A 34-year-old male with a high school education first showed symptoms of paralysis agitans when he was about 15 years of age. With the passing of time, tremor and rigidity progressed on his right side and his speech became markedly involved. Recently, the left side of his body developed tremor. Prior to his surgery, he had never been gainfully employed and needed assistance from his mother in almost all activities of daily living. The patient underwent a chemopallidectomy of the left side with good results. His symptoms were relieved on the right side of his body, and soon after surgery he was capable of carrying out most activities of daily living in an adequate manner. Within months he was capable of working part time on his family's farm. In a letter received from his family over a year after surgery, he was reported to be able to care for himself independently and to continue to assist on the poultry farm. At the time of writing, the patient continues to maintain his improvement and is still able to carry out productive work on the farm.

Case 3.—A 48-year-old housewife with three grown children noticed loss of power in the fingers of her right hand about eight years before initial examination. With the passing of time, rigidity and tremor developed, and recently her left side became moderately involved. She had difficulty in carrying out self-care activities and needed assistance in managing her household. The patient underwent a chemopallidectomy of the left side with good results and about one year later underwent a chemopallidectomy of the right side. When seen before her second operation, the patient reported that her right side continued to maintain its improvement and that she was capable of carrying out most household activities. However, the symptoms had progressed on her left side. Therefore, a chemopallidectomy of the right side was undertaken at that time. In a letter received from the patient recently, she reported that she is capable of carrying out daily activities in an independent fashion and can do some housework. The improvement was maintained on both sides of her body.

Comment

A review of the data concerning the initial situation for both the patients operated on and the control group reveals that, for the most part, we have been dealing with a severely incapacitated group of patients with paralysis agitans whose symptoms were severe and of a long-standing nature. In general, the illness had affected all areas of their lives, including self-care and social and vocational status. The groups were essentially equivalent, except for male patients in the control group who were, on an average, 10 years older than the male patients who underwent operation.

For the long-range situation, several differences were found when the groups were compared. In regard to the symptoms themselves, it is clear that the patients followed after surgery were in a better condition than they were initially, while the status of patients not operated on had deteriorated markedly. The improvement for the patients operated on, in general, was limited to the side of the body on which operation was done. Thus, while for both groups the illness itself apparently progressed, the operation had evidently stopped the development on that side of the body. For the group operated on there was seen a commensurate improvement in the ability to carry out self-care and housekeeping activities, while the patients not operated on deteriorated markedly in this regard.

In our broad inquiry in regard to the vocational status for both groups, we found substantially no change in the number employed in the group operated on but a significant decrease for the control group. Analysis of the data in this regard reveals that for the group operated on the surgery served to extend the work life rather than to return unemployed people to jobs. In general, however, the group followed after surgery, including those who were not working, reported feeling more capable of carrying out productive employment. This would indicate that a certain reservoir of patients is now available for intensive vocational rehabilitation work which may be directed toward eventual employment for some of them.

Summary

Questionnaires were sent to 141 consecutive patients with paralysis agitans (Parkinson's disease) who had undergone neurosurgery six months to two years and four months earlier. In addition, 173 questionnaires were sent to a control group of patients who were seen for evaluation over the same period of time but who were subsequently not operated on for various reasons. The questionnaires were concerned with three main areas: symptoms, ability to carry out activities of daily living, and vocational status for the male patients. Responses were received from 75% of the group operated on and from 60% of the control group. For the group operated on, 89% reported that tremor and rigidity on the side affected by operation maintained improvement, while only 10% of the control group reported this. On the other hand, less than 5% of the first group reported a worsening of symptoms, while 57% of the controls reported this. A similar but less striking trend was seen in ability to carry out activities of daily living and housework. From the vocational point of view, there was no significant change in the number of patients employed after operation, but 28% less patients who had not been operated on were working. Thus, it appears that the operation for this group served to increase the work life of the patient with paralysis agitans. Moreover, some patients who had not worked for years prior to surgery became gainfully employed after surgery. From the data received in the questionnaires, it is clear that the patient who had undergone surgery is for the most part in a better position than the one who had not undergone surgery in regard to tremor, rigidity, ability to carry out functional activities, and, for the male patients, in work ability.

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This study was supported in part by the Allen P. and Josephine Green Foundation, William Hale Harkness Foundation, Sister Kenny Foundation, World Rehabilitation Fund, and the Office of Vocational Rehabilitation of the Department of Health, Education, and Welfare.

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BOWEL REGULATION FOR PATIENTS WITH SPINAL CORD INJURY

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The function of defecation in patients with lesions of the spinal cord requires constant attention, especially during the first few months after injury. The vast majority of spinal cord injury patients lose voluntary control of the rectal sphincter and are usually constipated; however, during the stage of spinal shock and areflexia, they may have involuntary evacuations. These latter accidents should not be inhibited but should be provided for by protective pads about the anus. A regular regimen of water and food intake is established early; suppositories, abdominal massage, digital stimulation, and digital removal of scybala are usually necessary; the latter method is used with due caution. Mild laxatives and enemas are used only sparingly. When the patient can be safely out of bed, the regular use of the water closet is begun. The vast majority of patients maintain more or less scybalous stools and practice either digital stimulation or digital evacuation; they learn a combination of procedures that give the desired results and remove the fear of involuntary evacuations. Special problems, such as episodes of diarrhea, appearance of hemorrhoids, and the persistence of mass reflexes in response to stimulation of the anorectal area, can be solved by methods here described.

Bowel regulation is of paramount importance in the care of patients with spinal cord injury.[1] It requires more constant and continuous attention, especially in the first three months after injury, than any other type of medical rehabilitation. Yet it receives less attention than such conditions as bladder rehabilitation, decubitus ulcers, and spasticity. This is evidenced by the fact that, despite the tremendous amount of literature that has accumulated since World War II on the various phases of paraplegia, little about rectal regulation as such has appeared. Just as the physician carefully explains to the patient other methods of medical rehabilitation, so must he also spend the necessary time to explain rehabilitation of bowel function. The use of enemas and laxatives from the onset of injury is taking the "easy way out"—by the physician, not the patient, for the latter knows no better. The discussion that follows is concerned with bowel care as it is carried out by the Veterans Administration Paraplegia Center, Long Beach, Calif.

Bors[2] classified traumatic cord lesions that cause neurogenic bladder difficulty into two basic types: upper and lower motor neuron lesions. For practical purposes a similar classification can be used for difficulties of the rectum even though the rectum is not anatomically similar to the bladder. The autonomic nervous system innervates the rectum and internal rectal sphincter, whereas the somatic nervous system innervates the external sphincter of the rectum. Therefore, complete lesions at or below the conus medullaris will prevent reflex activity not only for the bladder but also for the rectum. On the other hand, lesions above the conus permit reflex activity at the level of the conus with subsequent reflex emptying of the rectum. Every effort should be made to have the rectum empty reflexly in those patients in whom the conus medullaris exhibits reflex activity. Although reflex activity may be absent in the conus, these patients can still have reflex activity through peristaltic rushes initiated at higher levels by way of the vagus nerve.

Bowel Care

Bowel care begins during the first few days after injury whether the patient is in a regular type of hospital bed or on a Foster frame. During spinal shock with its coexistent areflexia, a number of patients continue to have involuntary stools that are well formed. This of course, is explained by the fact that the vagus nerve is stimulated. These involuntary bowel movements in bed should not be stopped for esthetic reasons by the various preparations that are used; instead, the patient should have the necessary protective pads around the anus. Unfortunately, constipation is the rule in most patients after injury to the spinal cord. A regular routine is practiced from onset. In order to have bulk the patient must eat three regular balanced meals. Water is a necessity, but this problem is solved by the hourly drinking of a glass of water from 6 a. m. to bedtime as part of urinary bladder training. In addition, therapy with plantago seed (Mucilose) or like products is started, with the administration of 1 to 2 teaspoons each night. Mineral oil or olive oil is used, depending on the consistency of the stool. The dosage of the above medicaments depends on daily agreement between nurse and physician. While the patient is still in the bed-fast period, two glycerine suppositories are in-

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troduced at a specific time each day into the rectum. Twenty minutes later the abdomen is massaged by the patient (if paraplegic) or by an attendant (if the patient is tetraplegic). The massage starts over the cecal area and follows the course of the large intestine in a clockwise direction. If impaction exists, gentle stimulation and/or evacuation by means of the finger may be necessary. If the impaction is above reach of the finger, small enemas are indicated. The patient is given minimal doses of milk of magnesia. First, 250 cc. of tap water at 100-105 F is administered. If tap water fails, 150 cc. of mineral oil or olive oil may be given as a retention enema. The "1-2-3" enema of glycerine (30 cc.), mineral oil (60 cc.), and water (90 cc.) can be very helpful in obstinate cases. Soap suds and magnesium sulfate are not used.

Every effort is made to get the patients out of bed and into wheelchairs, braces, and/or tilt table as early as possible, not only to prevent osteoporosis and urinary calculosis but to develop "habit time" over the toilet.[3] The average paraplegic patient is ambulatory within a few weeks, the amount of time depending on the anatomic position of the vertebra and/or the neurological status. However, the average quadriplegic is usually held in traction for six weeks. Until the wheelchair patient has learned to swing himself onto the toilet seat he is lifted from his chair or his bed onto a toilet-chair which in turn is wheeled into position over the toilet bowl; this leaves enough space to admit either the patient's or the attendant's hand. The quadriplegic, of course, is lifted onto the toilet-seat or toilet-chair, unless he has sufficient use of his hands for self-care. Once the patient is over the toilet, the knees are raised to create as close to a "squatting position" as possible. Questioning of patients on discharge revealed that the majority visited the commode room either daily or every other day regularly and at a specific hour. There were a few who were well regulated with a visit every three days.

Once the patient is visiting the toilet regularly, the same procedure as is practiced during the bedfast period is continued; namely, introduction of two glycerine suppositories, massaging and tapping of the abdomen, and straining. Should the above procedures fail, "digital stimulation" is attempted by the patient himself or, if the patient is quadriplegic, by the attendant. This treatment consists of the introduction into the rectum of a gloved finger that has been adequately covered with lubricating jelly. In patients with upper motor neuron lesions the mere introduction of the finger into the anus may set off not only reflex evacuation of the rectal contents but also reflex evacuation of the urinary bladder. Sometimes it is necessary to gently stretch the overfacilitated external rectal sphincter and reflexly cause facilitation of peristaltic rushes with subsequent evacuation of the rectal contents. Admittedly, when questioned upon discharge, the vast majority of patients, irrespective of the type of rectal disturbance, eliminate the fecal material by means of "digital evacuation" when "digital stimulation" fails to bring about the necessary results. The patients feel that by having a more or less scybalous stool, with constipation, they have no fear of an involuntary evacuation while on the job or on a social outing.[4] In time, the patient will learn which procedure or combination of procedures will give the desired results.

Patients with flaccid external sphincters (usually due to conus and cauda equina lesions) can also have evacuations via the procedures described above. Obviously, with no tone in the external rectal sphincter, these patients have some difficulty in retaining the fluid when an enema becomes necessary. An inflated Foley bag catheter has been used in the past, but experience has shown that it should never be used.[1c] Deaths have occurred with the use of these balloon bags, following rupture of the rectosigmoid area with subsequent shock and peritonitis. The perforation is not necessarily due to distention of the intestine by the balloon but rather to a peristaltic rush with the inability of the intestine to expel the balloon, since its diameter when inflated is greater than the diameter of even a patulous anus. Those patients who were not "rectum trained" and have used the balloon should be instructed on the use of a small whistle-tip catheter while they are in the Trendelenburg position. An attempt should be made to stop these patients from using enemas; however, the conversion will take many weeks to months. When enemas are used, the rate of flow is regulated by the height of the can. The can usually is not held higher than 18 in. above the level of the rectum. The usual procedure is to give the enema while the patient is in the sitting position over the toilet. The catheter should only be inserted past the external rectal sphincter.

It is not the purpose of this paper to discuss the pathological conditions found in the gastrointestinal tract of persons with spinal cord injuries. Such conditions as hiatal hernias, esophageal strictures, peptic ulcers, segmental enteritis, mucous colitis, and diverticulitis occur in these patients as in any other type of patient. Naturally, the treatment of these conditions will affect bowel regulation.

Related Problems

Two problems are so closely related to bowel regulation that they should be discussed; namely, diarrhea and hemorrhoids.

Diarrhea.—The usual causes of diarrhea in this type of patient are toxic condition (high fevers irrespective of etiology) and food indiscretions. The latter is exemplified by the patient who goes home and overindulges in spicy foods after having become adjusted to the hospital diet. Whereas constipation will usually follow in many normal individuals after a laxative's initial effect, in many of these patients diarrhea will continue for indefinite periods if not brought under control.

It is self-evident that once the cause of the toxic condition has been found and treated the diarrhea stops. Other diarrheas are usually coped with by a check on the diet other than that which is served in the hospital. To check the acuteness of the diarrhea the usual procedures are used, namely, diarrhea mixtures, plantago seed, and methods to prevent dehydration (especially intravenously given fluids). Strong tea enemas have been of marked value in severe cases.

Hemorrhoids.—In spite of strain and digital manipulations of the anus, hemorrhoids do not present the problem that one might expect. Of 1,193 patients with traumatic cord injuries, only 53 (4%) have required hemorrhoidectomy. Once routine sigmoidoscopy and proctoscopy have ruled out neoplastic changes as the cause of bleeding, all patients are treated conservatively. The patient is placed on therapy consisting of bed rest, bland diet, plantago seed, oil, sitz baths, and medicated suppositories three times a day. Straining and digital evacuation are stopped. Administration of minimal doses of milk of magnesia is started, and it is preferred that the patient has involuntary stools into protective pads. If the above fails, water or oil enemas with gentle insertion of the catheter are in order. Once improved (usually in two to three weeks), the patient can go back to his previous regimen; however, if he has not used glycerine suppositories in the past, he is advised to use cocoa butter suppositories before each bowel movement.

Because of our constant effort to retain "bowel balance," laxatives and enemas are not ordered routinely before intravenous urography. However, nemas are permitted the afternoon before major urgery only to prevent contamination of the sur-ry pavilion.[5] Unfortunately, it may require weeks months to retrain the intestine and sphincters after upsets by laxatives or enemas. A number of patients who must use excessive strain to empty their urinary bladders will develop hemorrhoids. Introduction of a catheter into the bladder with conservative care of the hemorrhoids will usually suffice. The bladder is then reevaluated for ways of emptying with less strain.

Pathological Autonomic Responses

Stimulation of the anorectal area in patients with lesions above T-4 to T-6 (the sympathetic outflow to the abdominal viscera) results in pathological autonomic responses. The usual signs are sweating of the forehead, cutis anserina, nasal obstruction, and severe headache. At this time, examination reveals an elevated systolic and diastolic blood pressure with bradycardia. A variety of stimuli will set off this reflex, such as tactile and thermal stimulation of the skin and visceral distention or contraction. The viscus that is most responsible for this syndrome is the urinary bladder, with the rectum next in order.

The reflex mechanisms involved in these pathological responses have been described by Kurnick.[4] The stimuli from the viscera travel to the spinal cord, and thence cephaled to the level of the cord lesion through the spinothalamic tracts and posterior columns. On their way through the caudal cord stump these impulses cause a reflex outflow via neurons in the lateral horns; some create, by way of the sympathetic outflow, pilomotor spasm (with elevated blood pressure) and some cause, via the parasympathetic ganglia, pelvic visceral contraction. In the normal individual the increased blood pressure is picked up by receptors in the carotid sinus and aorta. This impulse is, in turn, relayed by way of the 9th and 10th cranial nerves to the vasomotor center in the brain where efferent impulses are sent forth to the heart to cause bradycardia and also efferent stimuli are sent down the cord to the lateral horns to inhibit the sympathetics for vasodilatation. In lesions above T-4 to T-6, the vasomotor center can respond to the stimuli from the receptors in the carotid sinus and aorta by bradycardia. However, the vasomotor center cannot send impulses past the site of lesion in the spinal cord to effect vasodilatation, and marked bradycardia and severe hypertension consequently result.

Control and Stabilization.—The application of dibucaine (Nupercainal) ointment to the anal area 5-10 minutes prior to manipulation will usually prevent the acute symptoms of the autonomic responses. If in spite of dibucaine ointment an acute response occurs, 0.5 cc. (12.5 mg.) of hexamethonium (Bistrium) chloride is given intravenously and may be repeated if necessary.

Stabilization of these pathological autonomic responses usually occurs spontaneously 12 to 18 months after injury. Stabilization can be aided by administration of 250 mg. (or more) of hexamethonium chloride by month every six hours. More radical procedures, namely, low subarachnoid alcohol blocks (5 cc. of absolute alcohol between L-5 and S-1 vertebra), selective rhizotomy, or sacral extradural neurotomies, have been used to date at this station for autonomic hyperreflexia from the urinary bladder only, which in turn affects the responses due to the rectum.

Comment

Regulation of defecation may not occur quickly; but the physician and nurse who conscientiously work on a daily basis on this problem from onset of injury will be rewarded with more patients regulated by "reflex stimulation" rather than by "digital evacuation."

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REASON UNDERLYING CONFERENCE ON MEDICAL EDUCATION AND LICENSURE

Leland S. McKittrick, M.D., Brookline, Mass.

The reasoning behind and the purpose of the 54th Annual Conference on Medical Education and Licensure can be very simply stated by asking ourselves a question: "Are those responsible for supplying medical needs to the people in this country aware of what these needs will be in the foreseeable future, say in the next 15 or 20 years; and are proper and effective efforts being made to meet them?" In recent years we have read much about the so-called population-physician ratio. The reader can find in the various discussions almost as many variations in what we have had and what we will need as there are writers who have made the estimates, and he is left with the impression that our only problem is to produce new physicians in proportion to the increase in population.

Is this a sound approach upon which to do our planning? Is it realistic to say that for a population of 106 million in 1920 we had 146,000 physicians, or 137 for each 100,000 of population; that in 1950 there were 204,000, or 135 physicians per 100,000; therefore, we will need approximately 297,000 physicians to care for our estimated 221 million in 1975? Does such an arithmetical approach give proper consideration to the many changing conditions that directly and indirectly affect medical service? If not, where did this magic number of approximately 135 come from, and by what fortuitous circumstances has this ratio remained relatively constant for a period of 35 years with no direct attempt to maintain it?

We have available to us certain facts: There are about 170 million people in the United States today, and the U. S. Bureau of Census estimates that this will rise to 221 million in 1975 or in 17 years from now. We know that there must be a progressive increase in the number of medical school graduates to meet future needs. We know, too, that money transformed into bricks and mortar is not all that is needed to develop a medical school that will meet the demanding standards of our present schools. We know that under any conditions medical education is costly and that it takes years between the determination to form a medical school and the time when the first graduates of this school will be of service to the public. The Association of American Medical Colleges estimates that this takes a total of 8 to 14 years: 2 to 4 years to plan the program, build the buildings, and secure the faculty; 4 years for the medical school education; and 2 to 6 years of intern and resident training in order to meet current standards of medical practice.

Advances in Science and Technology

Medical Progress.—It is these known facts which give us cause to pause and thoughtfully consider the many facets of our problem. There can be no question but that the ratio between total and physician population is important; but how important —and is a satisfactory ratio in 1958 a proper one in 1975? The world of today is a dynamic, changing world. This is true of advances and changes in medicine as well as in all other fields. In my own limited experience I have seen the control of diphtheria, diabetes, and pernicious anemia; the tremendous saving of life and shortening of illness and of hospital utilization by the antibiotics; and the control of infantile paralysis, as well as many other very notable advances.

Chairman, Council on Medical Education and Hospitals, American Medical Association.

Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 9, 1959.

Transportation.—It is difficult, for instance, to realize that on our railroads steam, which had dominated power for more than 100 years, was still king at the end of World War II. Between 1924 and 1944, at its peak, there were 65,000 steam locomotives on the railroads of the nation. Today these total less than 3,000, and in certain regions no steam-powered locomotives are being used. The whistle of the steam engine has fallen silent with stunning speed. Many a child is being born who will never see or hear one and will learn of them only through pictures or as toys.

Medicine.—To those who have arrived recently on the medical scene it is equally difficult to appreciate fully the phenomenal and dramatic changes that have occurred in this area during a relatively short period. The acute infectious diseases and other conditions that constituted the "killers" of such huge numbers of young children and adolescents in former years have largely been brought under control. In fact, some of these conditions are seen so rarely today that it is possible for a medical student to complete undergraduate medical education and even internship or residency training without having encountered some patients with diseases that were everyday experiences to the student of 30 years ago.

Through the utilization of growing knowledge in all of its branches, medicine and its allies have made rapid strides in the prevention of disease and in the reduction of morbidity and mortality from many conditions during early life. There has resulted a significant shift in the age composition of the entire population of our nation. Therefore, medical education, research, and practice now place greater emphasis on the prevention or retardation of the chronic and degenerative disorders of life.

Industry.—Modern industrial development, transportation, and mass communication, together with the scientific research which led to the discovery and utilization of atomic energy, have further complicated the picture. The growing mass of knowledge that created the background for these developments has stimulated an increasing need for specialization. It also has highlighted the need for integration and cooperation between specialists and their respective skills, if effective realization of their total potential is to be achieved.

Implications of Change

These and other factors have further accelerated the tempo of social and economic change characteristic of our society today. They have presented new problems and challenges to medicine and its allies as well as to other areas of activity. As these changes take place there is within all areas sincere concern in regard to the education, training, and development of the personnel needed to meet and solve effectively the problems with which they will be challenged.

It is not surprising that, with the current widespread interest in health, this changing scene has been accompanied by representation from various sources of increased needs for medical and allied personnel. No one will deny that, as our population grows at a rate far beyond estimates of a few decades ago, as health consciousness continues to grow, and as new problems arise, there will be continuing need for increased numbers of well-trained medical personnel. This will necessitate the facilities, finances, and faculty essential to their education and training.

The Association of American Medical Colleges, the Council on Medical Education and Hospitals, the National Health Council, and many other organizations have been concerned with the rising population tide, the changing social and economic aspects of life, and the changing dimensions of medical knowledge with their implications for needs in medical education.

In the current complex setting it is not possible to plan for medical personnel needs in simple arithmetical physician-population ratios as might have been the case in earlier years. One fact, clearly certain, is that efforts to compare unqualified statistics for physician-population ratios in recent years with those early in the century is not only meaningless, but actually misleading.

Memories of the horribly chaotic situation existing in medical education and practice early in the century have faded from public and even professional consciousness during recent years as the questionable borderline medical schools and shoddy diploma mills disappeared. As time rolls along, we tend to forget the important object lessons gained sometimes through years of bitter experience.

"How many doctors are enough?" has become an increasingly difficult question to answer. It involves an intricate knowledge of trends and efforts to forecast social and economic patterns, further population shifts, continued changes in the panorama of disease, and the portents inherent in further augmentation of the dimensions of medical knowledge.

One unquestionable certainty today for those engaged in medical education and practice is that *status quo* characterizes nothing except for the moment it exists. Change and progress continue. Without question, progress involves change, but change in itself does not spell progress unless it is founded firmly in values which themselves are changeless and which include intangibles at times difficult to measure in terms of science.

Change presents great challenges and responsibilities for, as has been stated by Kandel, "To fight change is futile; to drift with change is folly—

we must rather seek to understand what is happening and with such powers as we possess try to use current developments as pathways to progress.”

Too frequently in recent years organized medicine has been accused of side-stepping critical issues or of actively opposing some development or legislative proposal rather than presenting positive programs designed to aid in solving some of the problems presented by the changing scene.

One of the problems that lies ahead of us in all areas today involves intelligent planning for the education and training of personnel for the professional and technical fields. We, in medicine, fully recognize these needs, which are being precipitated by the growing population, social and economic trends, and the changing dimensions of medical knowledge. It is doubtful whether any of the estimates of specific personnel requirements in the *medical profession which have been projected from* various sources to date portray more than a general increased need in the period ahead. Reasonably clear definition of the need or of the variables involved is as yet undetermined.

For many years after the revolution in medical education which began in the first decade of this century, facilities for medical education developed gradually as there seemed to be need for them. As population grew and more physicians appeared desirable, state legislatures authorized their universities to develop medical schools. Private philanthropy also played a role of great importance in making it possible for privately owned and supported universities to develop and maintain medical schools. Some of these emerged as leaders in medical education and research.

One of the great questions now confronting the nation is whether or not, through continuation of the same manner of growth, adequate new medical educational facilities can be developed to meet these growing needs.

Delineation of Questions

Today the answers to such questions as this are difficult to determine. They can be determined only after clear delineation of the questions themselves. They cannot be determined by simply adding together the proposals of various interested organizations or groups, each of which has some particular interest or objective in view. It is, therefore, desirable to take a broad-gauge look at this total problem directed toward more clearly defining the question involved as well as trends and possible personnel needs to meet them.

What kind of physician will be needed in the period ahead? Should efforts be made to more clearly define the generalist and endeavor to stimulate more young physicians to enter this field? Will the need be for more specialists—and, if so, in what particular areas? What are the trends in practice, itself, which to a certain degree will determine the educational needs of the future? These and many other questions would appear to need careful appraisal as we observe trends and look into the future.

Can we utilize our currently existing schools of medicine more effectively to meet future needs? Is the development of more two-year basic medical science schools in appropriate university and clinical settings such as has been proposed by the Association of American Medical Colleges and our Council on Medical Education and Hospitals, the first logical step? Can institutions of higher education that have not developed medical schools and that hold potentialities whereby such a development could be mutually advantageous to the university and a medical school be encouraged to undertake such expensive obligations today?

*American medicine is deeply and sincerely in*terested in the future education and training of the nation's physicians. It has a right to be proud of the responsible role its Association, in cooperation with other organizations, has played in the development of the high standards of medical education and medical care which exist in the United States today. If we are to maintain high standards and play our role of responsibility in the fulfillment of the needs that lie ahead, American medicine must objectively look at current trends in population, society, economy, and at the vastly changing dimensions of knowledge within its own field in an effort to clearly define some of the questions to which answers must be found.

Today danger confronts our civilization, but opportunities greater than any existing before are also present. Opportunity can be lost if responsibility is side-stepped. One may not be responsible for something that happens when his eyes are shut; but even so, he may eventually be called to account for having his eyes closed at the very moment when they should have been wide open and alert.

We in American medicine must carry our responsibility in objectively and constructively playing our role to assist in defining as clearly as possible the questions concerning future needs for the education and training of physicians. “Responsibility,” it is said, “walks hand-in-hand with capacity and power,” and the manner in which it is utilized can be the determinate of any individual or group's contribution to his fellow men.

Norman Cousins has recently stated: “What the nation needs today even more than scientists is men of wisdom and vision. It urgently needs men with the clear and full view, men who understand what is happening in the world and are not continually being taken by surprise by living history and the effects of recognizable causes.”

The A. M. A. welcomes the opportunity afforded by the program of the 54th Annual Congress on Medical Education and Licensure to discuss objectively some of the areas of concern which carry realistic implications for medical education and medical practice in the period ahead. It is hoped that key background papers, the workshop-conferences, and the subsequent discussions will aid in defining more clearly some of the questions for which answers should be sought. Clarification of some of these questions will, in turn, assist organized medicine in determining how it can best assume the responsibility it should take in efforts toward achieving their solution.

104 St. Charles Place.

POPULATION CHARACTERISTICS AND TRENDS AND THEIR IMPLICATIONS IN MEDICAL EDUCATION

Dudley Kirk, Ph.D., New York

My subject is the changing population of the United States—the people who are the objects of medical practice and whose needs are the reason for its existence. I would like to describe some of the prospective changes in the numbers and qualities of the people of this country that may bear on some decisions in medical education.

It is a commonplace that medical education, even more than other professional training, must be planned in terms of the future rather than the present. Basic changes in curriculum or admission policies will be reflected in professional services, not in the 1950's but in the late 1960's. The creation of a new medical school is planning for medical needs even further ahead—in the 1970's.

My purpose is to give some clues as to what these needs may be. Let us ask ourselves several questions, which, if answered correctly, should give such clues. First, we may ask, "How many of us will there be?" Second: "Where will we live?" Third: "What will be our age structure and biological composition?" Fourth: "Who will we be in terms of our social, economic, and educational characteristics?"

Population Growth

The answer to the first question, "How many of us?" is relatively simple. Barring catastrophe there will be a great many more of us than there are today. We are already big: 172,830,000, with a record of enormous growth. We have grown by 100 million within the memory of a number of people in this room. We are going to be bigger. Each year we add 3 million, a population roughly the size of the Detroit metropolitan area.

To put it in a way that may be more real to physicians, there are each day 11,800 new Americans born (now well over 90% delivered by physicians in hospitals). Four thousand five hundred die each day, representing our daily failure in postponing death. An average of about 500 are added to our population each day through migration.

I do not really have to tell this audience that since the war we have had a continuing baby boom that has confounded many of the experts. There is not time here to venture into a full sociological explanation except to mention earlier marriages, earlier childbearing, and probably larger families, all encouraged by the tremendous postwar prosperity of the American people. Today the average American woman is married before she reaches voting age; she has her first child at age 22 and her last at age 26. She has more children than her mother's generation, fewer than her grandmother's. All this could be changed drastically were there to be some change in the climate of opinion such as might be induced by a major depression. There is now such a large element of voluntary control of births that the birth rate is very sensitive to economic fluctuations and swings in social attitudes.

In any event it may be predicted that the birth rate will decline somewhat in the next few years simply because there are fewer young adults to have children; this is the legacy of the low birth rates of the depression years. But every year that the present baby boom continues means more potential parents and more growth potential for the future. At the same time we are making great progress in postponing deaths. Together these trends in births and deaths spell great population growths.

Demographic Director, Population Council.

Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 9, 1958.

Taking all of these facts into consideration, the census bureau has made various illustrative projections of future population. I am showing one here that may be conservative (fig. 1 and table). It postulates no fall in the age-specific death rates after 1956, which most of us here would recognize immediately as an absurdity. It assumes the continuation of the 1950-1953 average rates of childbearing for women at each age and takes into account the smaller sum of potential young parents in the next few years. These assumptions lead to a lower over-all birth rate than now prevails.

U. S. Population 1900-1955 and
*Estimated U. S. Population 1955-1975**

	Population, Thousands	Increase per Decade	Increase per Decade, %
Census of 1900.............	75,995	...	...
Census of 1910.............	91,972	15,978	21.0
Census of 1920.............	105,711	13,738	14.9
Census of 1930.............	122,775	17,064	16.1
Census of 1940.............	131,669	8,894	7.2
Census of 1950.............	150,697	19,028	14.5
Estimate for 1955..........	165,248	...	...
Forecast for 1960..........	177,840	27,143	18.0
Forecast for 1965..........	190,296	...	...
Forecast for 1970..........	204,620	26,780	15.1
Forecast for 1975..........	221,522	...	...

* U. S. Bureau of the Census **Current Population Reports**, Series P-25, No. 123, "Revised Projections of the Population of the United States by Age and Sex: 1960-1975", Oct. 20, 1955. Projection A.

Nevertheless this projection leads to a prospect of enormous population growth. Not that the rates of growth are so high, but that, owing to the large base population, the amounts of growth are rising to high figures. A reasonable guess of our population in 1980, less than 25 years away, is 240 million, and a reasonable range of possibilities is 220 to 250 million, implying a population growth of between 55 and 85 million. We must in any case prepare for the largest absolute increases in population in our entire history.

Population Redistribution

Where will this larger population live? Most of us were brought up on the romantic history of the westward movement in the United States. Perhaps it has lost its romantic quality, and certainly there are no longer the hardships or the adventure of pioneering on the frontier. Nevertheless there continues to be a great trek to the West, bent southward to be sure by the attractions of sun and mild climate. The westward migrant is no longer a seeker after new land or even a refugee from the dust bowl looking for work in the commercial agriculture of the California valleys. The "Okies" and "Arkies" of today, if it is fair to call them that, are more likely seeking a bungalow in Los Angeles within easy driving distance of Hollywood, the beaches, and the supermarkets.

The actual pattern of population redistribution in the United States is illustrated by figure 2, which shows percentage change by states between 1950 and 1956. Note that there is a solid block of seven states, from Colorado and New Mexico to California, that are all growing much faster than the average and that this also applies to Florida and Texas.

If smog does not smother its people and its growth, California seems destined to supplant New York as the first state of the Union in population. The neighboring states of the Southwest, Arizona, New Mexico, and Nevada, are also growing much faster than the rest of the nation. If present trends continue, Nevada will lose its historical place as the last of the states in population and by 1975 will have passed several of the smaller states in the Rocky Mountains and the Great Plains. The above average growth of several of the smaller states on the east coast reflects the suburban thrust of major cities, notably New York and Philadelphia, and of Washington, D. C.

Two major regions are growing less rapidly than the remainder of the country or not at all: the rural South and the farm states west of the Mississippi River. From Virginia to Oklahoma (Florida excepted!) there is a continuing trek to the North and West despite a renaissance of southern industry and commerce. This movement, plus farm-to-town migration within the South, is helping to solve the traditional regional problem of poverty on the land.

If it is still good advice to recommend that the young man starting his career "go West," it is even better advice to the young doctor to recommend that he set up practice or join a medical center in the suburbs. Since 1950 almost all of the population growth of the United States has been concentrated in suburbia and increasingly in exurbia. Ninety-five per cent of the population increase since the last census has been in the metropolitan areas. The

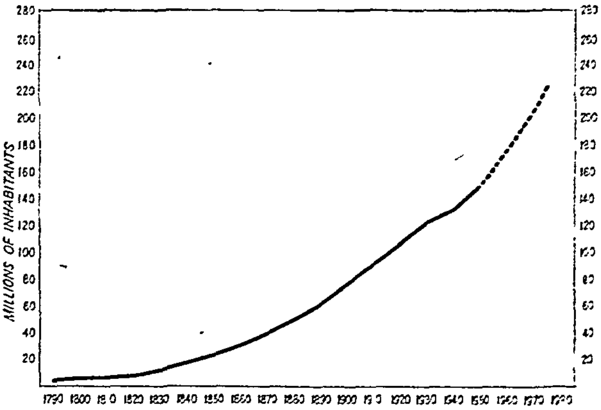

Fig. 1.—United States population growth, 1790-1955, and estimated growth, 1955-1975.

Census Bureau estimates that by 1975 two-thirds of our people will live in the metropolitan areas, and of these the greater part will then be residing outside the central cities.

In 1900 the median or "average" American lived in the countryside; by 1930 he lived in a small town of 5-to-10,000 population. By 1955 he lived in a big city or its satellites. By 1975, when the helicopter may have come into general family use, he may have gone full circle to residence in the small town or open countryside. The old distinctions between farm and city life in the United States are blurring as the people of the farms move to the cities and people in the cities move into the countryside. Suburban living is becoming the American way of life.

Among the problems that physicians will have to contend with in the future is the growing mobility of the population. We are not becoming nomads, as some seem to fear, but it is true that the upper and middle classes, the ones that use disproportionate percentages of medical service, are becoming more mobile. Each year about 20% of the population change residence. The classic situation of the family doctor who knows the medical history of his patients by virtue of having treated them from birth seems on the way to complete disappearance. Increasingly physicians will be faced with the problem of dealing with a segment of a person's life, often with only the aid of the individual's vague knowledge of his own medical history.

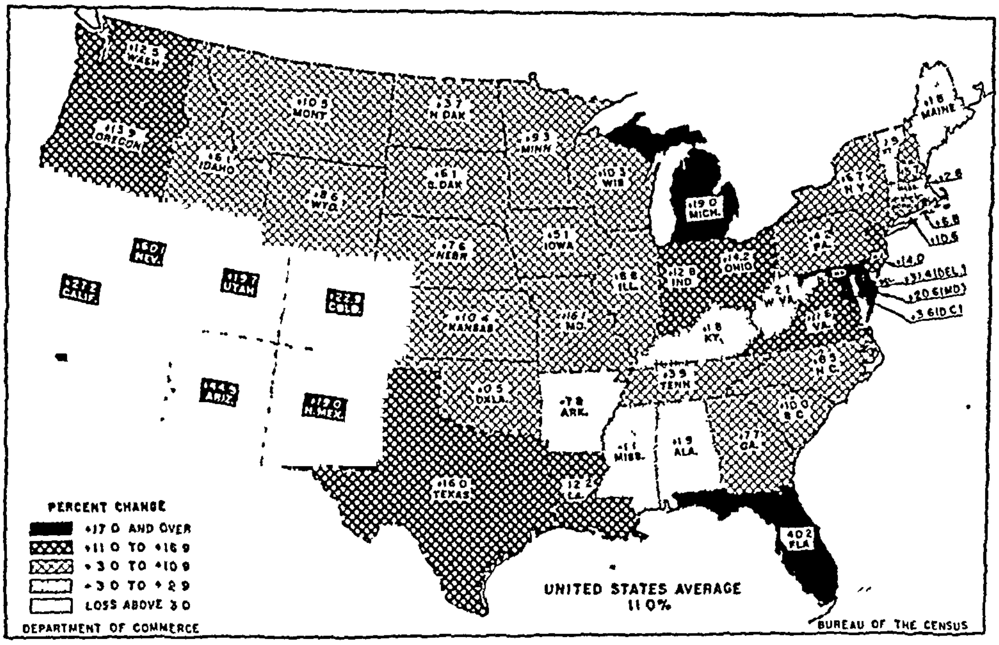

Fig. 2.—Percentage change in population by states, 1950-1956.

Changing Age Composition

Historically the average American was young. The median age was 23 in 1900, had risen to 26½ in 1930, and further to age 30 in 1950. It has since remained almost constant, but the constancy is deceptive. It balances two opposite trends; we are at the same time growing older and growing younger. The baby boom of the past few years has given us a wide base of children for the population pyramid, but the low birth rates between 1925 and 1940 are reflected in relatively small numbers of persons at ages 15 to 29. We are short on young adults, strong in young children and again in the middle groups from ages 30 to 49.

The large numbers of middle-aged persons today are of course the "old-age" problem of the future. The numbers and proportions of our older citizens will steadily advance, not sharply at any particular time but firmly and almost inevitably. Since 1920 the aged have been the most rapidly growing segment of our population, and it will certainly continue to grow more rapidly than the whole. The implications for medical specialties are, of course, understood by physicians. Obstetricians and pediatricians are likely to continue to be in demand, and the growing need *for specialists in degenerative* diseases and geriatrics seems likely to persist.

Already three-fourths of our deaths are attributable to organic diseases characteristic of late middle life and old age. Over one-half of all deaths are now caused by failure of the heart and circulatory system. Cancer is a dreaded runner-up. It is estimated that 40 million people now alive will in normal course die of cancer.

There is of course no reason to suppose that we have reached the ceiling of life expectancy. We have now attained an average expectation of life of the biblical "three score and ten," and there are clearly visible gains, quite aside from some dramatic breakthrough such as a cure for cancer, that can lift this to 75 or perhaps 80 years.

As the treatment of our physical ailments goes forward from one magnificent success to another we have become increasingly concerned with our mental well-being. I think it would be fair to say that the present treatment of mental and emotional disorders is reaching only a small part of those persons who might benefit from it. While more than half of those suffering from psychoses are receiving medical attention, estimates by the Public Health Service suggest that perhaps no more than 10% of the psychoneuroses, emotional disturbances, and disorders of behavior, character, and intelligence are getting competent professional attention. There is certainly a great need for increased medical personnel in this field.

The recent spectacular successes of several ataraxics, especially reserpine and chlorpromazine derivatives, have ushered in a new era in the treatment of mental diseases. But, as psychiatrists fully realize, these are treatments for the symptoms and not the causes of mental illness. The causes are probably as much in the field of sociology as of medicine.

Authorities estimate a continuing increase in the factors causing mental illness and particularly the combined effects of the aging of the population and the strains of urban living, to which a growing part of our population is exposed. It is well known that mental and emotional disorders are more prevalent among older people. At the same time the demands of urban life on the mind and emotions are greater, and marginal individuals who might "get along" in a rural setting cannot adjust to complexities of urban living.

In the face of these developments, caused by the changing age structure and way of life, one may speculate that further gains may require more intensive medical services to the individual than those provided in the past. The spectacular successes in conquering epidemic disease were relatively cheap in terms of medical service, since these were the product of environmental sanitation, inoculation, and, more recently, the administration of antibiotics. Future gains, notably in such areas as health management and the treatment of chronic and mental illness, would seem to require more intensive medical service per unit of the population.

I have spoken of the growing numbers and the changing composition of the population as they relate to the amount and kinds of medical service. I now turn briefly to another element.

Changing Social and Economic Characteristics

We are seeing a consistent trend toward upgrading the standard of living, the occupational class, and the educational standards of our people. As everyone knows, there has been a general rise in real income and in general a leveling process, which has reduced the disparities in the proportion of national income received by the several socioeconomic classes.

Perhaps less well known are the changes in the major occupations of our people. Within the labor force there is a persistent decline in the number of agricultural workers, domestics, and unskilled labor, who used to be referred to as "the working class."

Correspondingly there is a large increase in the number of skilled and clerical workers and in the managerial and professional classes. The changes occurring between 1940 and 1950 (our last decennial census) are shown in figure 3.

Finally, the levels of formal education of our population are constantly rising. Between 1950 and 1957 the average years of schooling completed by adults rose from 9.3 to 10.6, and the gains have been greatest among the previously disadvantaged. such as the Negroes. More representative of the future is the group of persons aged 25-29, who now average over 12 years of schooling. The average American in this age group is now a high school graduate.

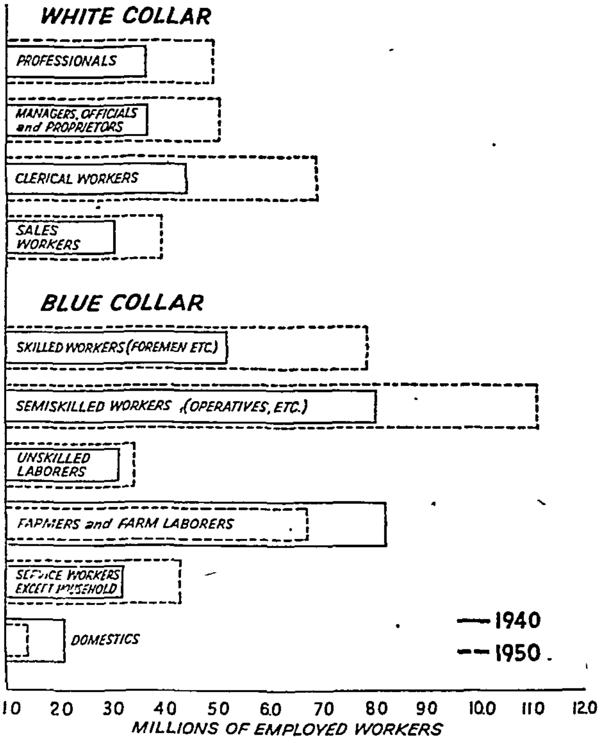

Fig. 3.—United States labor force classified by major occupational groups, 1940 and 1950.

As we all know, this general upgrading in the social and economic characteristics of our people means an increasing demand for medical service. It means both our increasing awareness of the value of medical care and increasing ability to purchase such care, whether under private, public, or group auspices.

Comment

I have referred to effects of four demographic developments affecting potential needs for medical services in the United States. First, massive population growth; second, the redistribution of the population to the suburbs and to California, Florida, and the Southwest; third, the changes in the age structure and way of life that are leading to growing problems of chronic and mental illness; and fourth, the general upgrading of our population in terms of income, occupation, and education.

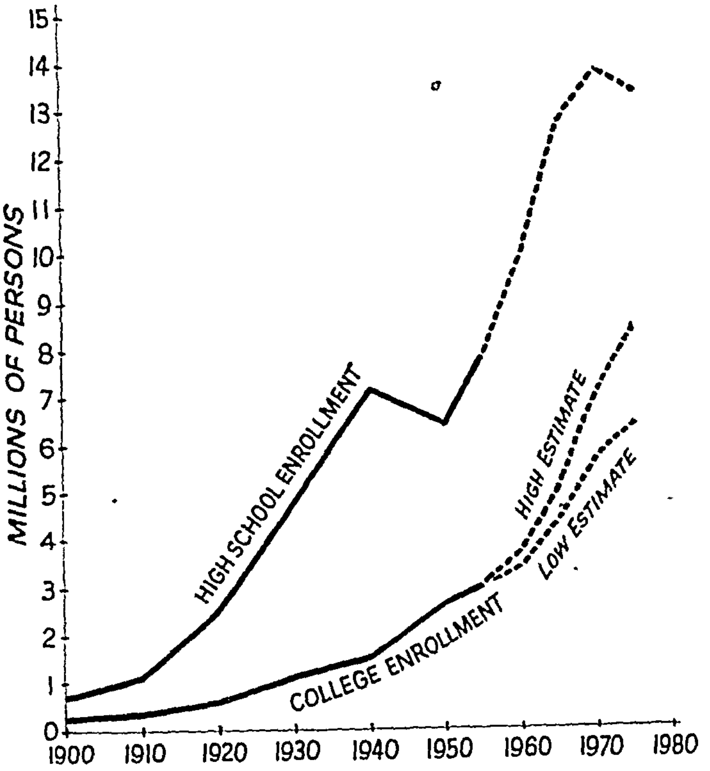

Fig. 4.—Enrollment in high schools and institutions of higher education, 1900-1955, and projected, 1955-1975.

Each of these developments has obvious relationships to the future demands for medical care and probably a number of less obvious needs that you as authorities in medical education are in a position to bring out. It seems to me, as an amateur, that these add up to an enormous increase in the potential demand for medical service.

In the space I have left I would like to turn the relationships around and speak of the effects of population changes on the potential supply of medical personnel. In a few years we will have a great upsurge in the number of young people available for specialized training and professional education. For example, look at the enormous increases projected for high school and college enrollment in figure 4. These increases are partly due to the fact that the wave of postwar babies will sweep into the high schools and the colleges. There will be many more young people than now in the high school and college ages. At the same time more and more young people have both the means and the aspiration to get a college education. Added together these spell a huge increase in the student bodies of our colleges and universities.

Other things being equal, this means increasing competition for both professional education and for jobs. Until very recently the relative shortage of young people put them in a good bargaining position. The greater numbers that will soon be on the scene will force much more competition for the available opportunities. This competition should make the long and rigorous professional training more attractive to the young college graduate than it is today. I think that medical schools need not be unduly worried about a dearth of applicants in the future.

It seems to me, in conclusion, that we can foresee a vast increase in the demand for medical services and, at the same time, a growing supply of candidates for medical training. Can medical education expand and redirect its facilities to produce the numbers and kinds of doctors needed? The question of "How many doctors is enough?" is a complex one indeed. But in balance I think it fair to say the medical profession is erring in the direction of preparing too few physicians in relation to the prospective needs for their services.

230 Park Ave. (17)

THE ELECTRON MICROSCOPE.—The electron microscope provides but one advantage over the light microscope, namely, higher resolution (10-20A) and consequently greater magnification (over 100,000 ×). There are several important disadvantages. First, the specimen must be placed in a vacuum and therefore dehydrated. Second, electrons are easily deflected and hence the specimen (as in the case of sections) must be extremely thin. Third, the electrons excite heat in any object they strike. The actual temperature of specimens during examination has not been recorded, but it is sufficient to alter their appearance. Fourth, since electrons cannot impart color, the selective staining which is so helpful to the light microscopist cannot be achieved. Fifth, the size of the field is inversely proportional to the degree of magnification, and consequently, at the magnification necessary to reveal details of viral structure, only a very small part of the host cell can be viewed on the photographic plate.—Councilman Morgan, H. M. Rose, and D. H. Moore, Use of the Electron Microscope in the Study of Intracellular Virus, *Bulletin of the New York Academy of Medicine*, February, 1958.

SOME TRENDS OF CHANGE IN AMERICAN SOCIETY

THEIR BEARING ON MEDICAL EDUCATION

Talcott Parsons, Ph.D., Palo Alto, Calif.

To the sociologist the medical, like other professions, is an integral part of the society which is the proper object of his studies. I speak therefore as a student of American society and within that of the place of medicine and health in its trends of development; within that, in turn, of the place of medical education.

I would like to organize my discussion about one major theme and pursue it through a series of phases of the problem. This is that the United States, as the most fully developed "industrial society" in history, has undergone, and is continuing to undergo, a grand scale process of differentiation in the structure of the society itself and in the culture which expresses and guides its institutions. As medical men with their biological training well know, differentiation must be complemented by processes and mechanisms of integration, which coordinate the functioning of the differentiated parts of a complex whole.

The emergence of medicine itself into a new position of prominence on the national scene about half a century ago was a part and consequence of this differentiation and integration process. Medicine both became more highly differentiated and assumed new and enhanced importance as a mechanism of integration in the society. It is now deeply involved in the process at a later stage. Let me try to follow this theme through in terms of five subtopics, namely: first, the institutionalization of conceptions of health and illness in society and their importance to it; second, a few highlights of the nature of the development of science that are relevant to medicine (I shall try to avoid overlapping with Dr. Hussey's paper); third and fourth, a few aspects of the changing structure of the society itself as it impinges on the individual as a patient and on the organization of medical services; and fifth, the relevance of the changes in science and society, in a few aspects, to medical education. In the nature of the case I can present only the broadest highlights.

Significance of Health and Illness in American Society

The problem of illness has been a critical one in Western civilization generally, in its more modern phase, because of the extent to which these societies have been oriented to values of active achievement in instrumental contexts, to the mastery of the physical environment, and to the development of effective social organization itself. Health is vital, because the capacity of the human individual to achieve is ultimately the most crucial social resource. Illness is, to the sociologist, essentially a disturbance of this capacity to perform in socially valued tasks and roles. Education, which is the building up of capacities through learning, and health, which is the maintenance of capacity, are the two great centers for provision and safeguarding of human resources.

In the American case this generally high valuation of health has been enhanced because of an "individualistic" cast of our society, one that tends to maximize the responsibilities of an expectation for decentralized units of the society rather than the larger collectivity itself. Hence attention, which might in a more collectivistic society be given to the organization of the state, with us tends ultimately to rest on the capacity of the individual.

Capacity to achieve roots deeply in the state of the organism but comes to flower, on a healthy organic base, in the individual's capacity, at the level of personality, to live with and utilize complex systems of symbols and to conduct highly sophisticated transactions with other persons in human relations. The more developed and mobile the society, the more important the responsibility, self-control, and skills of the individual. It is this context which makes understandable the rapidly increasing importance in our own time attributed to problems of "mental" as distinguished from "somatic" health. Within the general context of our very strong concern with illness and health generally, it is natural that many phenomena of disturbance of behavioral capacities at the higher levels of social participation, which previously were thought of as simple "misconduct," should come to be brought within the health-illness complex. Chronic alcoholism is a prominent example. Another important development is that of a borderline of "psychosomatic" problems where some kind of complex interaction of mental and somatic factors is postulated. These problems of the nature and boundaries of illness are far from settled in American society. But it seems to be clear that the field of phenomena defined as illness has been steadily broadening and at the same time becoming more highly differentiated. Within this latter category in turn the prominence of the mental health problem and the

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 9, 1958.

fact that this problem becomes a basis of organizing medical thinking that is not oriented simply to organ-systems of the body stand out. Incidentally, the importance of perspectives such as these makes one somewhat skeptical of the simpler versions of the view that alleged increases in the incidence of mental illness reflect some mysterious degenerative tendency in the population at large.

Some Aspects of the Scientific Background of Medicine

Turning now to the second of my main topics, the development of science, let me only mention a very few highlights. As Atchley and Wood made so clear in this Congress a year ago,[1] the whole range of scientific knowledge relevant to medicine has undergone an immense process of broadening and deepening in the last two generations, in a way that has already borne enormously impressive fruit for the control of disease and that will bear much more. The range of detailed knowledge has grown so enormous that it is out of the question for any single human being, to say nothing of an undergraduate medical student, to learn more than a small fraction of it. But fortunately, as Merton[2] has pointed out, this has been accompanied by a marked trend of what James B. Conant has called "reduction in the degree of empiricism." Science has not only grown and differentiated on empirical levels, it has also become more highly organized and integrated through theory. The consequence is that the scientific bases of medicine are becoming more dependent on generalized principle than ever before.

A second development in science is not yet nearly so impressive but, I am sure, is pregnant for the future. This is the emergence within about the last 40 years, in their relevance to medicine, of the so-called behavioral sciences, notably psychology (including psychoanalysis), sociology, and anthropology. These disciplines are, compared with physics, chemistry, and biology, clearly in their infancy and have only begun to have an important impact. That they have genuinely emerged is, in my opinion, one of the major cultural events of our time, and, though an interested party, I think I am justified in saying that there is no serious doubt that they are destined to take their place with their elder sister-sciences both in their ultimate contribution to our understanding of ourselves and of the world we live in and in their practical significance as providing knowledge which can be used to control events in the interest of human values and goals.

The connection of this scientific development with the emergence into prominence for medicine of the problem of mental health is clear. They are, from a sociological point of view, two different aspects of a new stage of development reached by the society. Clearly their emergence poses new problems of intellectual integration. These sciences are themselves now struggling to develop higher-order theory of their own. But at the same time there is a growing necessity to integrate them with the older natural sciences. Medicine occupies a very strategic position for this problem because of its obvious basic interests on both sides. Considerable progress could, were there space, be reported.

There are many implications of these developments for medicine. Looked at sociologically, I may emphasize, with Merton, not only has the corpus of scientific knowledge greatly grown, but scientific investigation and application as social institutions have been greatly consolidated and matured in the society. Clearly the modern university is the primary and focal center of this institution. The growth of science means that the connection of medical research and education with the universities, the importance of which Dr. Wood so strongly emphasized, has become more crucial than ever and is likely to remain a cardinal reference point for all medical policy.

Some Developments in the Structure of Society

The third of my main concerns is with a few major highlights of the structural development of American society that are not so directly associated with medicine. These may be looked at, first, from the point of view of the individual as patient, and second, from that of the professional groups that must take responsibility for the care of his health.

As recently as a half-century ago nearly half the American population could be classified as definitely rural; today it is probably below 15%. The change reflects changes not only in residential conditions but in what we sociologists call the role-structure of the society. The biggest change is the progressively sharper and wider-spreading differentiation between the roles an individual plays in his family group, in company with his special intimates, and those he plays in the organizations responsible for economic production, governmental administration, education, and health care and the like, namely, in his occupation.

The occupational aspect of the social structure has, relatively speaking, been growing rapidly. The overwhelming majority of adult males and of women without major family responsibilities have full-time jobs separated from the familial context, and the proportion of married women in the labor force has been increasing apace, though it is still a minority. In the occupational world, increasingly I think, status is a function of capacity, of what a person can do, rather than of "who" he is in terms of social class or ethnic, religious, or local background. With all the many qualifications which must be made, this is clearly the main trend.

The consequence has been a major restructuring, both of the family itself and of the local community. The family has become smaller, more mobile, certainly geographically if not class-wise, and more "isolated" from ties both to other kinspeople and to such kinship-like affiliations as the ethnic. It has lost most of its previous functions in economic production and has become focused on the welfare of its members as individual persons, including the all-important bringing up or "socialization" of children. The increasingly general concern with "psychological" problems is undoubtedly associated with this change in the position and structure of the family.

Another aspect of change, which in a sense bridges these two, concerns the local community. Clearly this is overwhelmingly urban, and no longer does it focus to the same extent as before on the big central city, with its Gold Coast and slums, as analyzed by Park and Burgess and their students for Chicago. The manifest change is the rapid growth of the "new suburbia." But I think that the old central lower-class slums are on their way out. For instance, the Negroes in northern cities and the Puerto Ricans in New York are special cases, in all probability the last of an era. More and more work premises will be in outlying areas, and residential areas will be more interspersed with them. Furthermore, residential areas will not be so sharply class-typed. This is in accord with a general tendency to greater complexity of structure rather than sharp hierarchic status-ranking.

There has also been a marked process of general "upgrading" of the population, most conspicuous in education and in occupational status. The lower fringe of the unskilled labor status group has been very greatly diminished in numbers and importance, and automation has begun to lessen the proportion of semiskilled jobs, manual and clerical. The numbers in "service" occupations have greatly increased, and, though they are relatively small, the numbers and proportions of the labor force comprising the highly trained managerial and professional groups have been increasing very rapidly.

Implications of New Developments

From the point of view of the medical profession this means that the physician is coming to treat different kinds of patients in ways different from before. He has to deal, with increasing frequency and not just in "elite" practices, with educated, skilled, and relatively sophisticated people, who nonetheless have their troubles. The old style "charity" wards and clinics, especially in the centers of slum-ridden cities, are likely to diminish rapidly in relative importance. Certainly special concern will have to be taken for the problem of the "whole patient." But the patient, because his own life is more complex, will have to be looked at in the different "lives" he lives, notably that of his home and that of his job. The trend to specialization in medicine is bound to continue. But new integrations will be needed and bases of differentiation and integration of a higher order worked out. It is my guess that specialization by organ-systems of the body will become less important as the level of generality of medical science itself rises; the "internist" will absorb many previous specialties. Psychiatry, on the other hand, cannot be treated for very long as cognate with urology or dermatology. I also suggest that the organization of medical specialization will have to match the role differentiations of the person, above all in terms of differentiation between "family" medicine and "occupational" medicine.

The implication of the general growth of large-scale organization and of science, and of the professions on a wide front is that medicine will, as a profession, come to be increasingly intimately associated with other professional and administrative groups. The present relation to the lay representatives of the basic sciences on medical faculties is the prototype for a much wider development. I predict that social scientists will soon begin to take their place beside biochemists and bacteriologists. The relations of both these groups and medical personnel in turn to their colleagues in the faculties of arts and sciences of the universities will become increasingly close, particularly as the role of research in the higher-level medical installations continues, as it is certain to do, to increase. But this type of relation is also likely to extend to areas that are not now thought of as directly associated with medical interests, notably the social organization of hospitals, clinics, and medical schools.

There seems to be little doubt that the major trend of the society is toward an increasingly important role for the professions generally. For the past half-century or so the business man has indeed been the main "community leader" in the United States. I suspect that his heyday is drawing to a close and that the business groups will decline in relative status as the problems of economic production come to be relatively well "solved" and other functions in the society emerge into greater urgency and salience. Functions of government are certainly among these and I look for both a relative rise in prestige of those associated with it and a marked "professionalization" at least of those aspects associated with its administrative functions. Education and research are certainly also among the rising professions, and the recent relative lag which they have been allowed to suffer cannot continue much longer.

Considerations such as these have, I think, two particularly conspicuous implications for the medical profession. First, medicine was, along with law, essentially the first of the secular, high-level professions. For long it stood, in its field, relatively isolated in a comparable status. Now the range of professional development has begun to broaden immensely, most conspicuously through the development of science. Medicine has lost many of its previous prerogatives to science as it bears on health and will lose more. The early stages of the process were dramatized nearly a century ago by the contributions to medicine of the chemist, Pasteur. Just as a large part of "medical" physiology was taken over by natural science, so scientific jurisdiction over much of the earlier "art of medicine" is beginning to be taken over by social science. Medicine hence is becoming in one sense more specialized. As Dr. Sidney Farber has stated,[3] in many contexts like research, the physician is only one of a team of coequal experts in many fields. He is not even necessarily "captain" of the total team even though the problem be mainly "medical." It is essentially where the problem becomes that of responsibility for the welfare of patients that his special prerogative takes precedence. But on a scientific problem he may well have to bow to the superior competence of a layman. Thus, as part of the general process of differentiation in society, not only has medicine been becoming more specialized internally but it has been becoming at the same time a more specialized part of a larger complex of professional specialties.

The second implication of the "professionalization" of the society is that medicine, like law, is less likely in the future to find the higher business classes its most appropriate "reference group," as some social scientists call them. In such matters as the organization of their functions they are less likely than in the past to look to the patterns of economic "free enterprise" for their model. Furthermore, they are less likely to look to the income levels of their neighbors in business occupations for the standards of appropriate medical income.

Points on the Organization of Medical Services

In the light of such considerations as the above, I think that many of the older problems and controversies concerning the social organization of medical services are becoming obsolete. I do not look for what has usually been meant by "socialized medicine" in the future in the United States, nor do I look for preservation or restoration of the pattern where the typical physician practiced on a strict fee-for-service basis. There will not be less but more collective organization.

The technology of medicine, its internal differentiation, and its interlocking with numerous nonmedical specialties and services all require complex and large-scale organization, the importance of which is bound to increase. Medicine, one of the highest of all our technologies, cannot be expected to be exempted from this general trend of the society. But these organizations can be expected to take many forms, including a bewildering combination of governmental and private bases of control. Just as it is today taken for granted that medical schools are needed both in private and in state universities, so it will, according to general social trends, go with the other aspects of medical organization.

With respect to financing, another aspect of the general trend is certainly relevant. This is the taking over of a variety of financial responsibilities, *previously carried unaided* by families, by different kinds of specialized agencies. We no longer keep our liquid money funds under the mattress; we deposit them in the bank or directly invest them. We save through insurance and contributory or even noncontributory pension plans and the like. It is, to my mind, quite unrealistic to expect that the individual family will typically wish to pay for medical care on an *ad hoc* basis, when more effective ways of handling the problem are available. But again I expect there to be a wide variety of such devices with, however, the common features of prearranged provision and pooling of resources. I would also expect it to become increasingly a matter of public policy to assure rather high minima of access to health care to the whole population, independent of the financial resources of the family and indeed independent of the level of "providence" of the individual or his family.

One further point is relevant in this connection. It has already proved true over a wide front that employing organizations are very convenient agencies for the organization of such financial provisions, and I should expect this trend to increase. After all, the employing organization is the principal source of family income, and a relation needs to be established between this source and two primary family financial responsibilities, namely provision for health care and for old age.

A related but distinct problem is how far the actual practice of medicine will come to be organized about occupation as a focus. It is my guess that a considerably larger proportion than heretofore will have this character, particularly in those fields where the illness or disability can be considered to be in any direct way connected with the job situation. The family not only remains but in a certain sense has become even more than before the focus of the "personal integrity" of the individual. I should therefore expect family-oriented practice, whatever organizational forms it may take, to remain the primary base of operations for concern with the "whole patient." It seems to me reasonable to expect that the family practitioner will lean more and more in the direction of primary attention to psychological rather than somatic medicine. Partly this is because a great many of the problems of the latter are coming to be solved. With their solution the physician is under much less pressure to serve as a kind of glorified nurse, mitigating the anxieties and discomforts attendant on waiting for the spontaneous forces of recovery to operate. Partly this is at the same time due to the simultaneous emergence of "personality" problems into saliency in the new type of family and the growth of technical knowledge on the basis of which they can be more rationally dealt with.

Such family practice will necessarily have to be closely integrated with the somatic specialties which are traditionally so closely related to family situations, notably obstetrics, gynecology, and pediatrics, though the latter beyond the early years must be almost equally closely related to the schools. Beyond this there must be a ramified system of agencies by which the patient needing important specialized diagnosis or care can be routed to the proper people. I would look to the more dispersed structure of the modern residential community for the most promising models for the location of the most likely types of hospitals and clinics, rather than to the recently prominent central-city hospital or medical center. With modern transportation within urban areas and the expected concentrations of population, this should not be too difficult to work out.

A Few Implications for Medical Education

Throughout this brief discussion I have emphasized the fundmental processes of differentiation and integration that have been going on and can be expected to do so in American society. Because of the special role of science and its institutionalization in this process and of the special significance of the health complex for the society, medicine has and should continue to occupy a central strategic position within the society, but it is also exposed to a peculiar degree to the pressures created by the rapidity and fundamental character of change. In this situation medical education faces both formidable difficulties of adaptation and a tremendous opportunity. The difficulties are, I hope, apparent from knowledge common to the profession and from some of the things I have said. The opportunity is to play an even more strategic role in a growing great new society than it has done in the past. I would like to try to specify in three related directions.

The first concerns response to the general situation of the sciences relevant to medicine which, following many others far better informed than I, I have sketched above. One major focus of the problem is the growing length of the process of medical training, which has been such a source of concern to many within the profession. That good medical training should be as long and arduous as that in any profession, I should take for granted. Yet I am inclined to think that it has tended to grow inordinately and that the primary reason for this is a tendency to adhere to too much empiricism, to find it difficult to accept the inevitable codification of knowledge in terms of higher-level theory and the attendant renunciation of great detail except for the range of the field in which the individual is being trained to be a really detailed expert. No individual can pretend any longer to be a detailed expert over more than a fraction of the field of medicine, or, of course, any other of the really big fields of human knowledge and practice. But this need not mean that medical men must be "superficial." They can be trained in the grasp of general theory and much illustrative fact, particularly crucial fact. And if well trained they should know when they do not know the detailed answers in particular fields and where and how to proceed to get those answers. In sum, I suggest that the implications of Mr. Conant's aphorism need to be taken very seriously indeed.

The second point is essentially an application to a special case of the first. Unless I am grossly mistaken, both the relative importance of mental illness in the whole field and the scientific knowledge necessary for its competent handling are destined to grow greatly in the coming half-century. I feel strongly that the medical profession as such should be the central agency, in this field as in that of somatic illness, for the responsible treatment of patients. But if the profession is to meet this challenge it must undergo a major reorganization, not least at its growing point of medical education. The present treatment of psychiatry as one specialty among many others, which may not be entered upon without a full "orthodox" training in general medicine, means that it is impossible to increase the number of psychiatrists rapidly. At the same time the demand for their services is enormous and increasing rapidly. If medicine does not meet the demand, then other agencies will step in, which I would greatly deplore.

Clearly, to be competent to handle mental cases the physician must even now not only have more clinical experience with them but learn much more in such fields as psychology and sociology, and, as these sciences develop, this requirement will become more onerous. For a large group to do this in addition to meeting the present requirements is out of the question. The only solution I can see is to train the future "psychological physician" in general medicine in much more general terms than now, except for some fields very close to his own, like neurology. In other words the differentiation between psychological and somatic medicine must reach much farther back than now, into the undergraduate years. And "psychological medicine" must become not just one specialty among others but probably one of the two great primary branches of the profession.

My last point concerns the placing of medical practice, through the educational policy of the profession, more fully, with reference not only to the relevant scientific traditions but to the social setting as a whole, including the social organization of science. I think the physician needs to be trained to be not less but rather more responsible, particularly for the welfare of patients, than before. But this high responsibility must, increasingly as the society develops, be discharged in a setting where the patient leads a more complex life and is harder to "get at" as a total person than before and where the profession itself must learn to cooperate with many different lay agencies, starting with the sciences that are not primarily medical. From the "rugged individualism" of a kind of splendid professional isolation of the medical past to integration in this more complex system of cooperating groups and agencies means a major transition.

To accomplish the transition smoothly and successfully, physicians must be trained for it. Indeed in the modern medical school and teaching hospital great steps have already been taken in this direction. If it is fully carried through medicine will have a brilliant future as the key element in a combination of agencies that will ensure a future high level of health on all fronts, which would have been beyond the most optimistic dreams of any earlier generation.

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CHANGING CHARACTERISTICS OF OUR ECONOMY

THEIR IMPLICATIONS IN MEDICAL EDUCATION

Meyer Kestnbaum, LL.D., Chicago

For more than a century the American economy has exhibited a steady rate of growth. This growth can be measured in terms of the output of goods and services, which have increased at the rate of approximately 3% a year throughout most of our history. As a result of this capacity to grow and to produce we have been able to double the standard of living of our people every 25 or 30 years. At the same time we have been able to enlarge our capital investment so as to assure future growth.

American Growth

The unique characteristic of the American economy is that the benefits of economic growth have been widely distributed among our people. To be sure, the scale of industrial enterprise has required large aggregations of capital, but it will be found upon analysis that these aggregations of capital, as represented by such organizations as industrial corporations, banks, and insurance companies are owned by millions of individuals. It is true that we have many millionaires and a highly prosperous upper middle class, but the great mass of our people are concentrated in the middle-income group, and there has been a steady decline in the proportion of the population properly described as "poor."

Raised Standard of Living.—Insofar as they had extremely low standards of living and complete lack of economic security, three-fourths of our people could at one time have been regarded as living in poverty. President Roosevelt, during the early days of the New Deal, referred to the "submerged third" of our population. He was speaking at a time when there were 14 million persons unemployed in the United States and when the private means for coping with the distress of individuals had become entirely inadequate.

We can still identify a hard core of poverty in the United States, but the number of persons who are properly put in this category would constitute considerably less than 10% of our population. Through a combination of public and private activity we have greatly relieved the impact of this condition. There is still much to be done, but the distinguishing characteristic of our economy is that it has enabled more and more of our people to live decent, respectable, and comfortable lives, that the proportion whose condition might be considered as substandard has been steadily reduced, and that we have exhibited through a wide variety of government programs and through many instances of private activity a strong sense of responsibility for those groups in our society who are not able to achieve for themselves the status and circumstances that we regard as basically essential for people in our society.

President, Hart Schaffner & Marx.

Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 9, 1958.

Implications of Growth

It is this growth that has given us the great sense of progress that has characterized American thought, American political activity, and American economic activity for more than a century. It is this growth which has permitted a steady advance in the conditions under which our people live. This growth comes about through the application of our energies, aided by science and technology, to the forces of nature, and our improvement is based primarily on our capacity to produce more effectively and more economically a larger volume of goods and services.

The notion that somehow this arises through beneficent legislation or through a more equal distribution of the wealth in our society is one of the problems that we must deal with in persuading our people that the progress that is being made is satisfactory.

Speaking as a businessman, I should say that one of our difficult problems in determining how our resources are to be allocated is to get our people to understand that this process which has produced so much is one for which we, the people, are responsible, and that it is not produced by any alchemy nor by any magic at any particular political center, and particularly not by any remarkable constellation of talents in Washington.

Parsons (page 31) has pointed out (and I will not try to expand on what he had to say) the impact of these changes on the way in which our people live. Suffice it to say that we have raised our standards, that we have eliminated most hard and arduous and disagreeable work, that more of our people are doing interesting work than ever before, and that the educational requirements for the complex organization which is required to carry on the work of society have been raised tremendously.

Changed Distribution of Personnel.—I think it might be useful to point out also that the most remarkable change that has occurred has to do with the relationship between the number of persons employed in direct production and those who are engaged in providing our society with a wide variety of services. In the early period of our history we needed one person in farming for every four members of the population. In the Soviet Union today approximately half of the workers are still engaged in farming. In the United States today one farmer feeds 20 persons. The agricultural revolution has had a profound impact on our economy because it has permitted us to take people off the land and out of agricultural production and to bring them into industry and to facilitate the remarkable industrial production which has so largely revolutionized our society.

A somewhat similar process is going on within industry. It is not uncommon to think of industry as an organization in which millions of people are engaged in arduous, repetitive activities. Much of the literature dealing with industrialization visualizes the worker as being, if not chained, at least closely tied to a machine that will rivet a certain bolt in a certain complicated manufacturing process. This picture of the industrial process is not an accurate one.

Out of some 64 million persons employed in the United States, approximately 16 million are engaged in manufacturing, and of those 16 million many are engaged in what might be called the management planning functions of manufacturing. The number of persons actually doing repetitive work of the kind that was visualized in some of the literature is extremely small. Even the service aspects of business have grown, and we are now in the process of a clerical revolution which will greatly reduce the number of persons engaged in so-called white collar activities of a tedious nature.

As we have been able to produce the food and fibers that we require, the industrial products which we require, and the transportation and communications that are necessary, we have also enlarged the opportunity for the rendering of the services that are an important index to the quality of our economy.

Expanding Role of Nonmechanized Services

At this point in our history there is a great deal of confusion as to the possibility that, with increasing technology and increasing productivity, we shall soon create large-scale unemployment. This psychology has affected the thinking of some economists, some (not too many) of the trade unions, and some of those who are engaged in trying to plan for our economy. The truth is that we face not a surplus of workers either on the farm or in industry but rather a tremendous shortage of people who can perform the services that are required in our society that do not lend themselves to mechanization or organization, on a basis comparable to what has taken place in farming and in industry. I am referring, of course, to such services as health, education, and the manifold services rendered by government, which is probably the fastest growing business in our society today. It seems to me that it is important for us to recognize that the implications of these changes with respect to our social and political philosophy are extremely important.

Government.—I would like to say a few words on the subject of government and our changing concept as to the proper role of government in our society. There was a period in our history when we felt that government was something that was necessary to preserve the peace, to protect us from foreign aggression, to regulate commerce, but that in the main "that government governed best which governed least."

this high responsibility must, increasingly as the society develops, be discharged in a setting where the patient leads a more complex life and is harder to "get at" as a total person than before and where the profession itself must learn to cooperate with many different lay agencies, starting with the sciences that are not primarily medical. From the "rugged individualism" of a kind of splendid professional isolation of the medical past to integration in this more complex system of cooperating groups and agencies means a major transition.

To accomplish the transition smoothly and successfully, physicians must be trained for it. Indeed in the modern medical school and teaching hospital great steps have already been taken in this direction. If it is fully carried through medicine will have a brilliant future as the key element in a combination of agencies that will ensure a future high level of health on all fronts, which would have been beyond the most optimistic dreams of any earlier generation.

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The unique characteristic of the American economy is that the benefits of economic growth have been widely distributed among our people. To be sure, the scale of industrial enterprise has required large aggregations of capital, but it will be found upon analysis that these aggregations of capital, as represented by such organizations as industrial corporations, banks, and insurance companies are owned by millions of individuals. It is true that we have many millionaires and a highly prosperous upper middle class, but the great mass of our people are concentrated in the middle-income group, and there has been a steady decline in the proportion of the population properly described as "poor."

Raised Standard of Living.—Insofar as they had extremely low standards of living and complete lack of economic security, three-fourths of our people could at one time have been regarded as living in poverty. President Roosevelt, during the early days of the New Deal, referred to the "submerged third" of our population. He was speaking at a time when there were 14 million persons unemployed in the United States and when the private means for coping with the distress of individuals had become entirely inadequate.

We can still identify a hard core of poverty in the United States, but the number of persons who are properly put in this category would constitute considerably less than 10% of our population. Through a combination of public and private activity we have greatly relieved the impact of this condition. There is still much to be done, but the distinguishing characteristic of our economy is that it has enabled more and more of our people to live decent, respectable, and comfortable lives, that the proportion whose condition might be considered as substandard has been steadily reduced, and that we have exhibited through a wide variety of government programs and through many instances of private activity a strong sense of responsibility for those groups in our society who are not able to achieve for themselves the status and circumstances that we regard as basically essential for people in our society.

President, Hart Schaffner & Marx.

Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 9, 1958.

minent than I believe is generally recognized even within the profession itself. There is not time to sit around and talk about how we may adjust ourselves to this tremendous increase in the demand for medical services of all kinds. I think Parsons has pointed out very wisely that the institutional changes that will result from the impact of this demand are likely to be quite substantial and that the role of the practitioner in this field may also change substantially.

I wish it were possible for us to devise techniques and methods by which the effectiveness of professional activity could be enlarged on a basis somewhat comparable to the application of technology to production. I realize that the ideal of the teacher is one man on one end of the log and the teacher on the other, and the ideal in medical practice is the practitioner who knows all about his patient and who serves him as an individual. And yet even a very rapid calculation would suggest that it would not be possible to provide enough doctors in our country to give this kind of service to our entire population and that it will not be possible to provide enough teachers to give this kind of teaching to all who need to be educated.

When we add some of the other services which are considered necessary and desirable in our society, it is clear that the ideal which we seek would be reached if there were two or three persons available in our society to serve every individual member of our society. If you can figure that out, we will have achieved the ideal.

Education.—On the subject of education there have been some ideas—the use of television, the extension of the effectiveness of the teacher in other ways. There are devices that will be found useful, and it is conceivable also that to some extent our people will teach one another. But it is difficult to see the counterpart of that process in the field of medical services. It may be that the day will come when the American family will be sufficiently well educated so that most of the most elementary health problems can be dealt with at the family level. This may happen. There is very little to indicate that it will happen in the near future.

Some suggestions have already been made as to the role of the practitioner who has to deal with the very simple needs of a family, many of which might have been avoided if that family had had a larger store of education. I have no doubt that many of the neuropsychiatric problems that have been referred to may possibly be dealt with on a group basis, or at least with some sense of group understanding at the school level and at the industrial level if we get to know more about the nature of these problems and can learn something about the preventive possibilities. I think this is conceivable, although I shudder to think of the kind of therapy that would be available in the typical industrial establishment today.

Conclusions

Perhaps I can best emphasize what I am trying to say by pointing out that if these needs are as great as appears to be indicated, it will be necessary, if we are to avoid complete organization of the profession under some kind of a state or organizational institutional arrangement, to find ways of using doctors more effectively, using the institutions more effectively, and getting a larger degree of help from the other institutions in our society, notably the family, the school, the church, and our industrial establishments.

It is very easy to state this problem, or at least to indicate how it might be stated. It is somewhat more difficult to propose how it might be dealt with; but it does seem to me that it becomes a major challenge to the medical profession and that the changes that are required ought to be encouraged rather than resisted.

On this point I speak now of the point of view, not of the great institutions of learning or of the leaders of the profession but of many practitioners, who occasionally develop an attitude that is comparable to that which is to be found in other organizations that feel that the best contribution they can make to our society is to see to it that the present institutional arrangements are changed as little as possible. We find this point of view in many of our large groups, and in this connection I do not except business management. Business management has been just as guilty of this attitude as any of our other groups. Some of the trade unions have exhibited the same tendency.

The central problem of the society in which we live, as I see it, is to accommodate ourselves to the very rapid changes that are taking place largely because we have a productive society which permits rapid changes. A static society does not generate these problems because it does not have the productive capacity that would permit these social changes.

Writing parenthetically again only as a layman, I should say that one of the problems which we face in remote sections of the world is that unrest and dissatisfaction have been communicated to large numbers of people without the means by which these dissatisfactions can be relieved. In other words, they have shared our discontent without being able to share our great productive capacity and the flexibility that we have somehow developed in our social organization.

In this same connection it would be highly useful, I believe, if, in examining these problems, we also had a somewhat more realistic understanding of what is involved. I have already suggested that there seems to be an assumption that any services rendered by government are free—that is to say, that we do not pay for them—and that the solution to problems which we cannot meet at the local level is obviously to be found at the national level.

The American people have a remarkable interest in the solving of problems. We are a problem-solving people. Unhappily most of the great problems with which we are confronted are not soluble. We must deal with problems which cannot be solved. I suspect that this is true in the general area of health. We may find a cure for a particular disease, but the problem of health as a whole I suspect, will never be solved as long as men are human and mortal.

The problem is also true of the body politic. I speak now of the distinguished professional men who are also citizens and who have views on this subject of political and social change. Therefore, I would like to conclude these remarks in a most elementary kind of summary by saying that as a result of a rather remarkable industrial system and a highly adaptive kind of society, we have the means for the advancement of our lives to an extraordinary degree. This is a process which must proceed in an orderly fashion, because many of our problems are still beyond our capacity.

The central problem in this whole field of health, it seems to me, lies in a wise determination of what portion of our resources should be devoted to health in relation to the other needs of our society and to find ways of meeting these needs most effectively in terms that will recognize the many other claims on our society.

36 S. Franklin St.

CHANGING DIMENSIONS OF MEDICAL KNOWLEDGE

THEIR IMPLICATIONS FOR MEDICAL EDUCATION, RESEARCH, AND PRACTICE

Hugh H. Hussey, M.D., Washington, D. C.

It is evident to everyone that dimensions of medical knowledge have changed. Wood gave the dimensions and described the changes at the 53rd Annual Congress.[1] However, one thought from his talk must be repeated. The change in dimensions—the growth of knowledge—is in a phase of rapid geometric progression. Life would be so simple if fact A led to fact B, to fact C, to fact D, and so forth (fig. 1). As it is, fact A leads to new facts B_1, B_2, B_3 . . . B_n. Each new fact, in turn, leads to a similar expansion (fig. 2). So, medical knowledge has grown enormously in recent years, and there have been exciting and sometimes frightening effects upon medical education, research, and medical practice. Those three items will be considered somewhat separately (fig. 3, *top*), but you must remember that they are all part of a larger pattern (fig. 3, *bottom*).

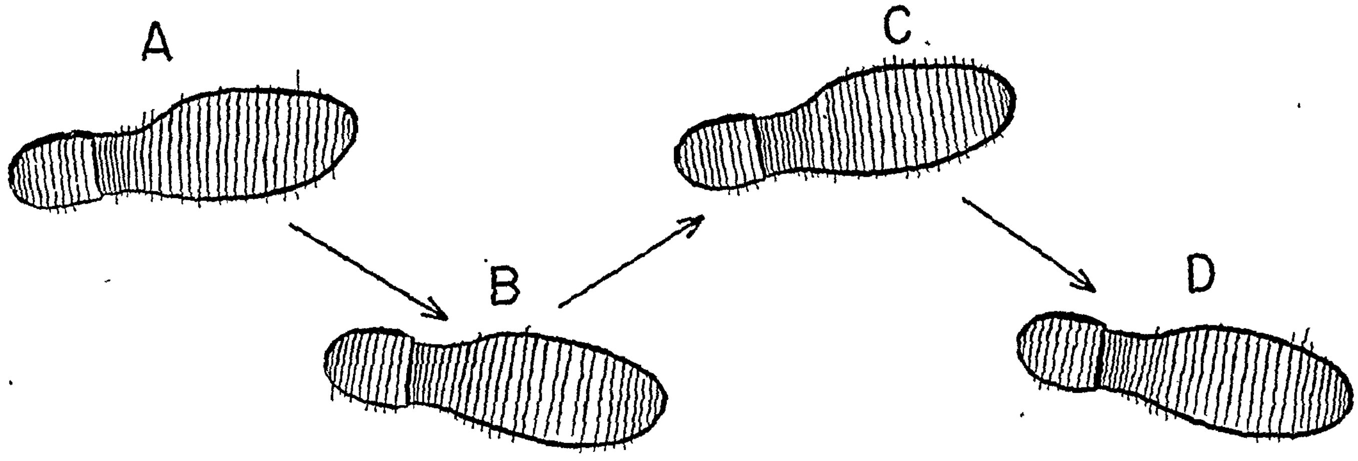

Fig. 1.–Life would be so simple if fact A led to fact B and so forth.

Professor of Medicine, Georgetown University School of Medicine.
Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 9, 1958.

Enlargement of the body of medical knowledge naturally means an increase in the work for teachers and students. For the teachers, there is more information to impart; for the students, more information to receive. One other corollary effect deserves brief mention because it has created problems all its own. The growth spurt of medical and all scientific knowledge has overtaxed methods for storing that knowledge and of bringing it out of storage on demand. The sheer volume of medical literature has the libraries bulging at their seams (fig. 4).

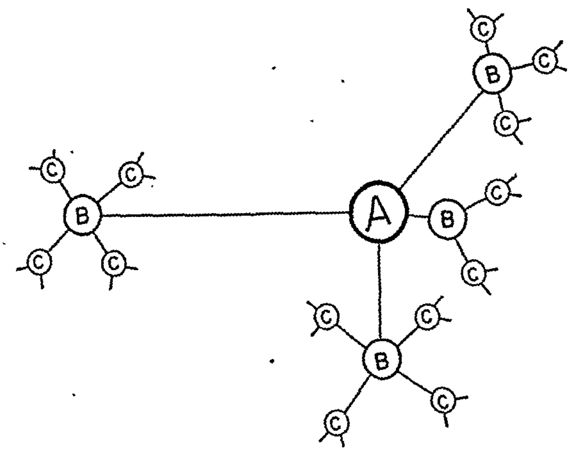

Fig. 2.—Factual knowledge increases geometrically.

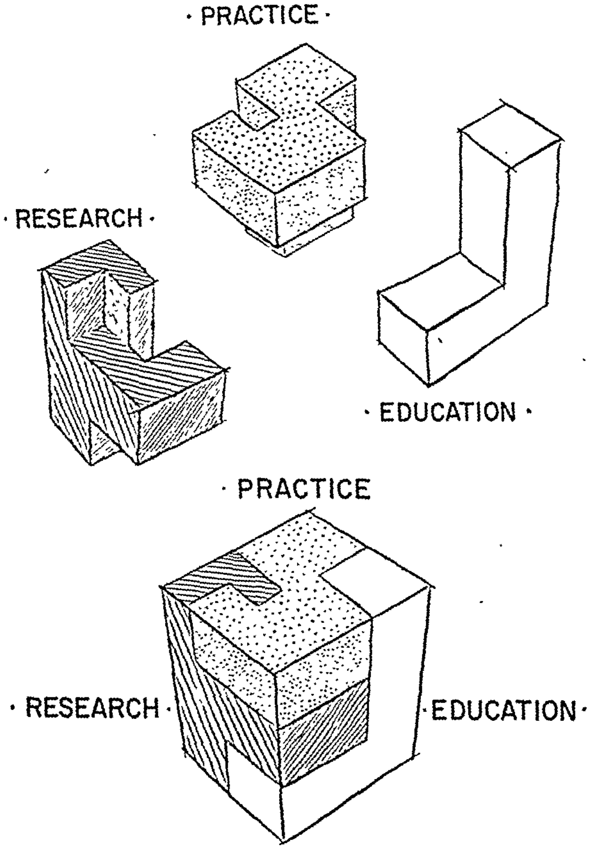

Fig. 3.—*Top,* the three elements in medical scheme. *Bottom,* the three elements as part of larger pattern.

Growth of Faculties

To return to the proper thread of thought, an early result of the growth of knowledge was specialization. This has affected techniques of teaching as well as those of practice. The chief development in the medical schools has been an increase in the number of "full-time" clinical teachers. For example, 25 years ago, in a medical school of modest resources and reputation, it was not surprising to find a department of medicine in which the director was the only full-time man (fig. 5). Today the picture is quite different. In that same school, the

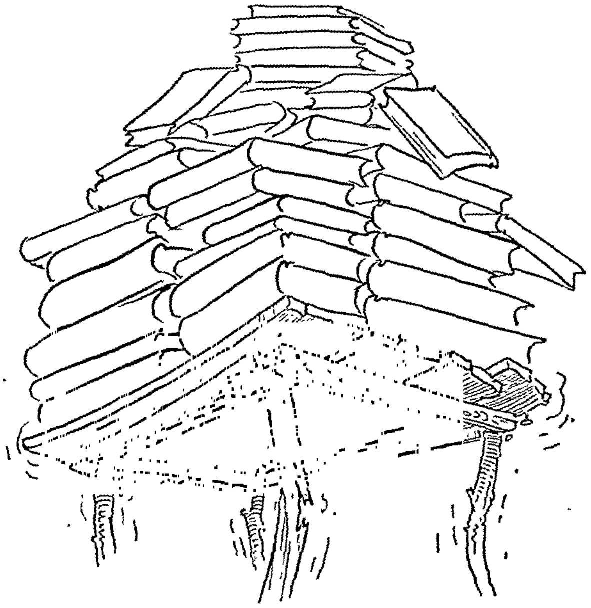

Fig. 4.—The growth of medical knowledge has overtaxed the libraries.

Fig. 5.—Twenty-five years ago a department of medicine often had only one full-time man—the director.

director is likely to have quite a large group of full-time people, representing areas of special clinical interest (fig. 6).

Fig. 6.—Today, the department director is likely to have quite a large group of full-time people.

Such growth of medical faculties had many good effects, but my assignment demands that I write about some that are not so good.

Teachers.—Few of the full-time teachers have received training in educational methods. At some schools, methodology of teaching receives considerable attention from faculty; at others it is still largely neglected.

Teacher Shortage.—There is a shortage of teachers of all kinds, and it is likely to increase (fig. 7). The shortage was demonstrated in the 57th Annual Report of the Council on Medical Education and Hospitals of the American Medical Association.[2]

Money.—Faculty expansion and other necessary changes within medical schools have cost a lot of money. The resources of the schools have been strained to the utmost, even with substantial help from the American Medical Education Foundation, the National Fund for Medical Education, and other important contributors. To compound the financial misery of medical school administrators, the problem of "soft" money has arisen (fig. 8). You will hear about that term at almost any medical school nowadays. It refers to money that may melt away at any moment, at the whim of a Congress or the directors of a drug company. It contrasts with "hard" money that is derived from the school's own resources. Unfortunately, "soft" money has necessarily become an important element in faulty support.

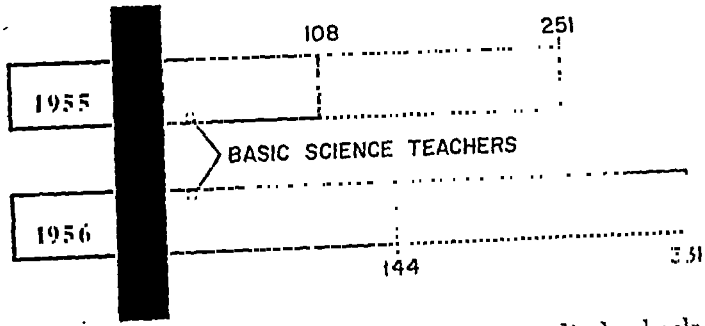

Fig. 7.—Serious shortage of teachers in medical schools. Unfilled full-time faculty positions in U. S.

Division in the Ranks.—There has been a growing tendency to division between physicians who teach and physicians who practice medicine. To those of you who are familiar with Roger Price's "droodles," figure 9 may suggest the picture of a nude searching for a collar button, or a croquet wicket for Siamese twins. It is presented to emphasize the need for unity within the medical profession. Unfortunately, doctors of the town and doctors of the gown are divided—they have stopped communicating freely, and that is dangerous (fig. 10). The teachers need to be closely in touch with the practitioners, all the more so when you consider

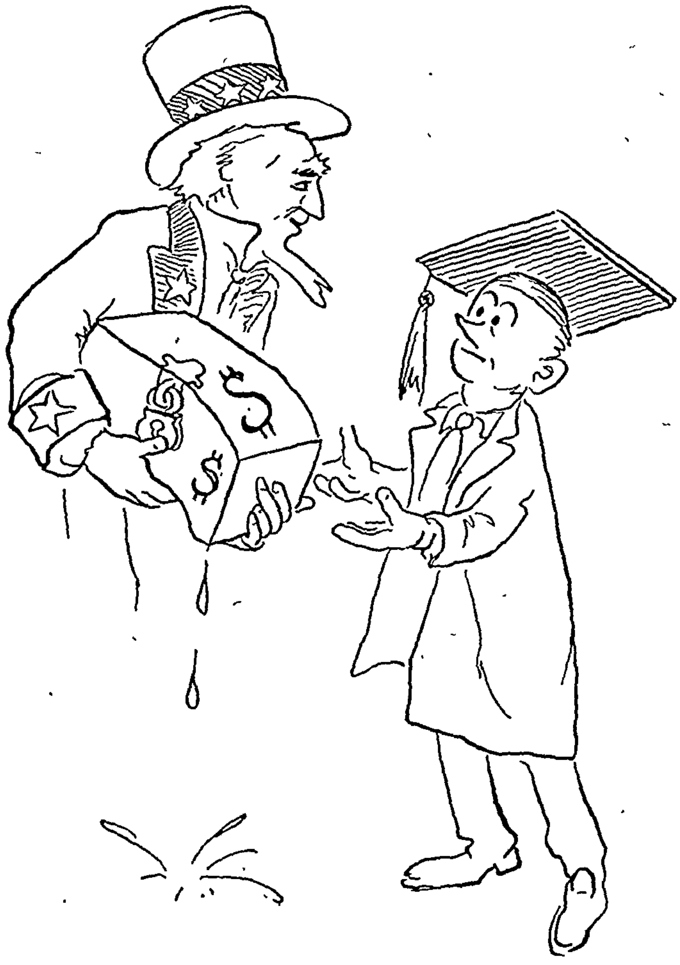

Fig. 8.—So-called soft money has become an important element in faculty support.

that this small segment of the medical profession—the teachers—is the one which has earliest and strongest influence upon the next generation of physicians (fig. 11). At the 1956 Congress, Dr. Harvey Stone had some good suggestions for "filling the gap between academic medicine and medical practice."[3]

A Premium on Research.—An extraordinary premium has been placed upon research by faculty members. This is not solely a result of changes within the medical school. Other factors have had an important influence—public interest in research as something glamorous, the generosity of the government and of drug companies and private health agencies, and man's natural curiosity about the unknown.

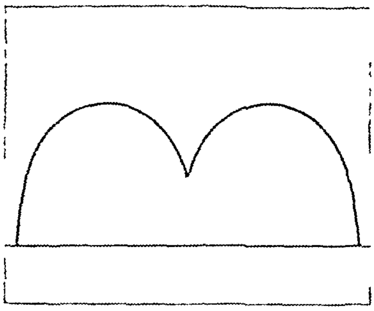

Fig. 9.—Roger Price's "droodle" of "a nude looking for a collar button" suggests the need for unity between doctors of the town and doctors of the gown.

In any event, research is big business in medical schools today. It is having a considerable influence upon their faculties. One effect, "hydridism," was described by Dr. Charles L. Dunham in a speech to the American Chemical Society last fall (fig. 12). He recalled that when he was a medical student each departmental discipline was self-contained. Then he made this observation:

> What we see today is department names giving a clear indication of the teaching responsibilities of that department, but very little by way of a clue as to the nature of the research being done in that department. Biochemistry and physiology were the first to become inextricably mixed, then biochemistry and microbiology. . . . Hybridism is on the rampage today and the still undefined biophysicist is one of the most potent examples of this breed.

Please understand that I believe in medical research as an integral part of medical education. However, there are threats of danger when medical schools make a fetish of research, when it derives much of its financial support from sources that in turn influence its direction, when it outweighs other considerations for academic advancement, and when it becomes the province of untrained or half-trained workers.

Effects on Students

Expansion of medical knowledge has also had important effects upon medical students. Curriculums have been altered and techniques of teaching have changed. For example, principles are emphasized over facts,[4] learning by experience has assumed paramount importance in the clinical years, and correlation and integration have become fashionable in revised curriculums.

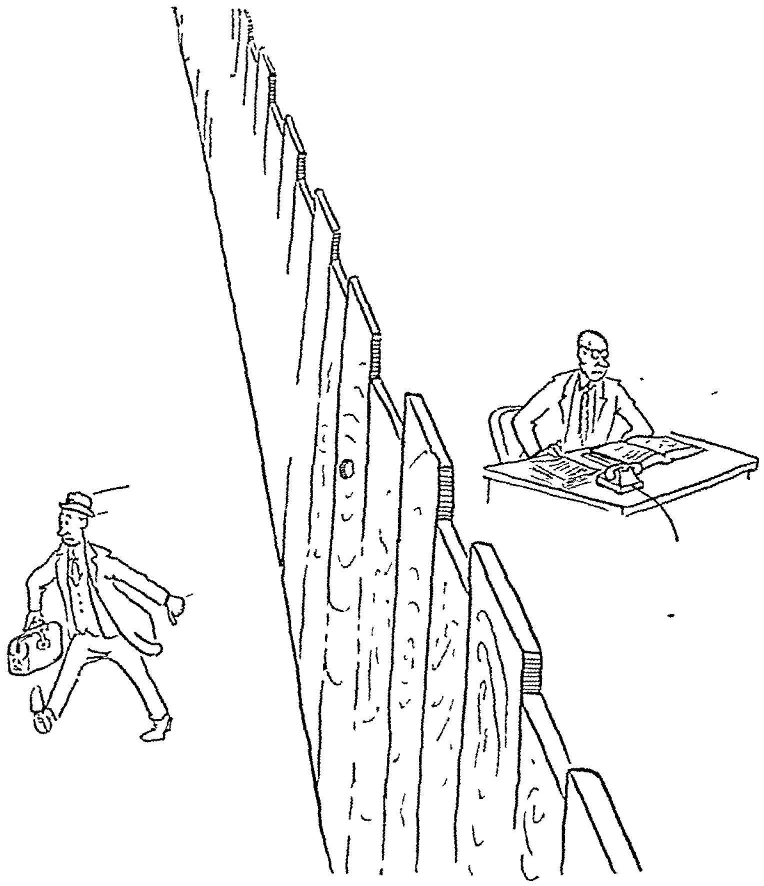

Fig. 10.—Unfortunately, physicians who teach and physicians who practice are sometimes divided.

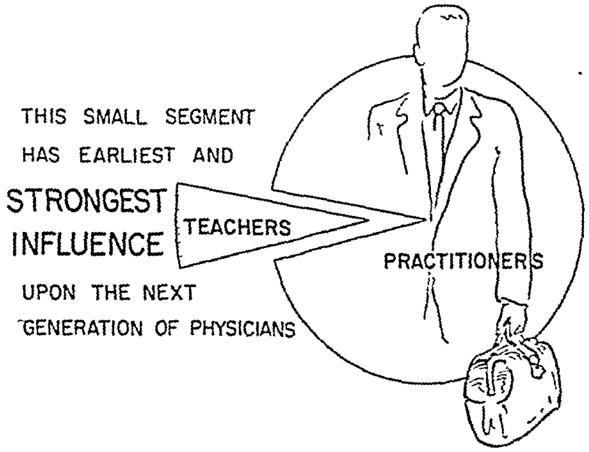

Fig. 11.—Teachers' Influence on Practitioners.

Accordingly, the medical student's burden has increased enormously. Not only is he expected to learn more in four years than his predecessors of a short time ago but he is called upon to accept more and more responsibility for his own education. His teachers less often act as guides for his educational explorations (fig. 13). They give him a map and point the way (fig. 14).

Fig. 12.—The "hybrid scientist" is a product of present-day research tendencies.

Fig. 13.—Medical school teachers less often act as guides for their students' education.

The principle of this change is in the best American tradition of pioneers and self-made men. However, there are risks—not the least being the heterogeneity of students, the comparative isolation of medical education from all that has preceded it, and the differences of opinion among medical teachers about teaching methods (fig. 15).[5]

More than ever, in the new educational environment, it becomes important for teachers to consider the fourth R that Darley wrote about in 1954.[6] He represented medical education as a simple formula: $\frac{CM}{R}(TP)$, where C is the student's intellectual capacity and M is his motivation; TP is the medical school program; R represents the factors that interfere with the student's learning and distract his attention (fig. 16). Some of R is produced by teachers and their methods. But a large part of R is a result of the student's anxiety about other things, and this brings me to the subject of money again.

Like the cost of everything else, tuition in medical schools is more expensive today than it was 20 or 25 years ago. However, this is only a small part of the price that is currently paid for a medical education. In comparing costs today with those of the past, you must consider the reduction in income-producing years that has resulted in part from the growth of medical knowledge (fig. 17). The diagram contrasts the experience of two graduates, both internists. The 1957 graduate will be six years later in launching his career in practice than was the case for his 1934 counterpart.

Fig. 14.—The teacher simply points the way.

Medicine has always required arduous and long preparation. However, something needs to be done about the picture in figure 18 if medicine is to attract its share of bright young people. In that connection, *GP* recently commented, "Perhaps the time has come to stop talking about approaches and to get busy with making some definite plans. Certainly the planning stage would require the interest and participation of many different groups —college educators, medical educators, other scientists, organized medicine, government, licensing agencies, and others."[7] It is indeed hopeful that this congress is devoted to such planning.

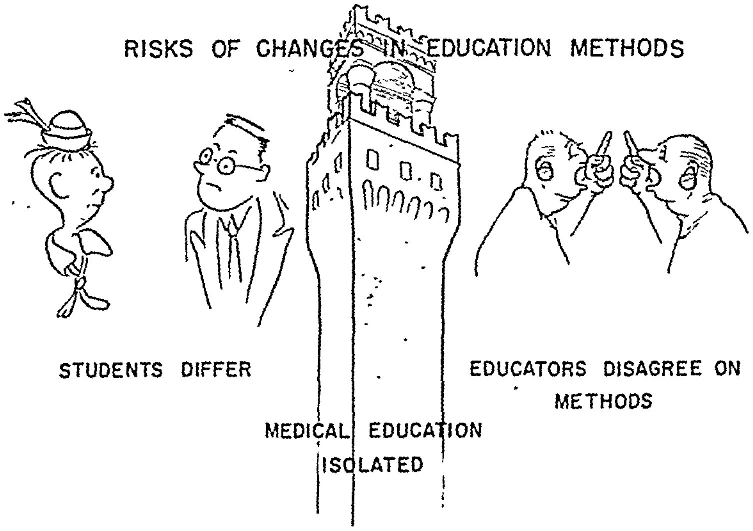
RISKS OF CHANGES IN EDUCATION METHODS
STUDENTS DIFFER
MEDICAL EDUCATION ISOLATED
EDUCATORS DISAGREE ON METHODS

Fig. 15.—Student assumes more responsibility for own education.

$$\frac{CM}{R}(TP)$$

C = INTELLECTUAL CAPACITY OF STUDENT
M = MOTIVATION
TP = MEDICAL SCHOOL PROGRAM
R = FACTORS THAT INTERFERE

Fig. 16.—Dr. Ward Darley's formula for medical education.

The Practice of Medicine

Hospitals.—The growth of medical knowledge has led to a larger use of hospitals, has added greatly to the intricacies of hospital care, and has raised the costs of hospital operation. One of the most important side-effects is an extraordinary increase in house staff positions (fig. 19).[8] The increase is out of all proportion to the number of graduates from United States medical schools. Consequently, many internships and residency positions are vacant, and a large number are filled by alien physicians (fig. 20).[8] The unfilled positions and the increasing number of alien physicians are problems that deserve careful assay and thoughtful planning. Otherwise, there is risk of deterioration of the educational value of the internship and of the quality of hospital care.

The Practicing Physician.—The enlarged dimensions of medical knowledge have created many troubles in medical practice. For the physician personally, the most serious difficulty is in staying abreast of medical knowledge. Better means must be devised for his postgraduate education if he is to assimilate all he should of the new information that pertains to his practice (fig. 21). This is true for specialist and general practitioner alike.

In the whole field of medical practice many changes have taken place, and others are coming fast. Some of the more important are entry of the "third party" into the economic scheme of medicine, group practice, increasing specialization, and the changed pattern of the practice of internal medicine so that internists and general practitioners have a mutual interest in being known as family physicians.

The Public.—You might suppose that the public —the consumers of medical care—would be grateful for all the wonderful medical advances of this century, and indeed they are. They like their own doctors. However, they think other doctors leave a lot to be desired. Also the consumers are beset by troubles with costs and sometimes with getting a physician when they need him. And, to some extent, they have been led away from affiliation with a single "family physician" and into the bad habit of self-diagnosis for the purpose of picking the right specialist.

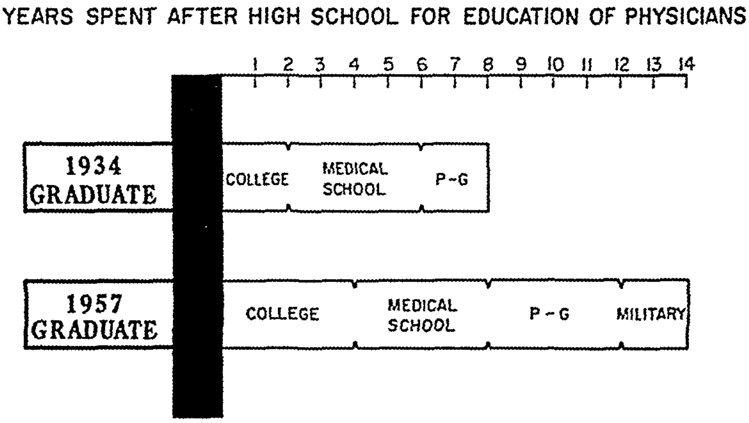

Fig. 17.—The physician's income-producing years have been reduced.

In this connection, one segment of public opinion —the opinion of the physicians themselves—provides a thought-provoking note upon which to conclude this essay. Curiously, physicians have a worse opinion of themselves than their patients do. This was brought out in a nationwide survey [9] summarized in THE JOURNAL [10] (fig. 22).

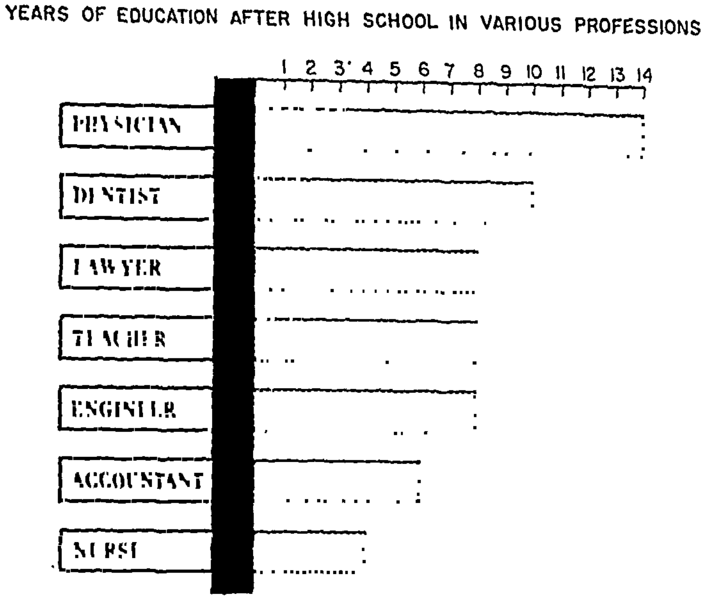

Fig. 18.—Something may need to be done about this picture if medicine is to attract its share of bright young people.

That summary concluded: "It seems evident that the individual doctor needs to form a better opinion of his colleagues and to convey that opinion to his patients. If he himself helps create derogatory impressions of other doctors, he thwarts the public relations efforts of his profession."

That statement seems to imply that impressions can be turned on or off, or made hot or cold, like water from a shower faucet. It implies that physicians are privileged to form only good opinions about their fellow physicians. Probably those implications were not intended. It seems more likely that the writers of the survey summary meant only to urge upon all physicians a critical self-examination. That's a sound intention, based undoubtedly on "first cast out the beam out of thine own eye."

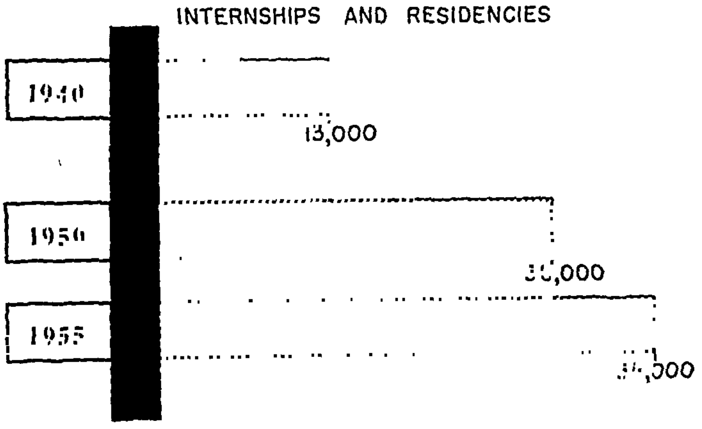

Fig. 19.—There has been an extraordinary increase in house staff positions.

But the second part of that verse from the seventh chapter of Matthew adjures, "then shalt thou see clearly to cast out the mote out of thy brother's eye." So, in physicians' problems with their impressions about their colleagues, a similar venture in group therapy may be indicated. Perhaps mutual examinations will be more productive of mutual understanding and respect. When they can think

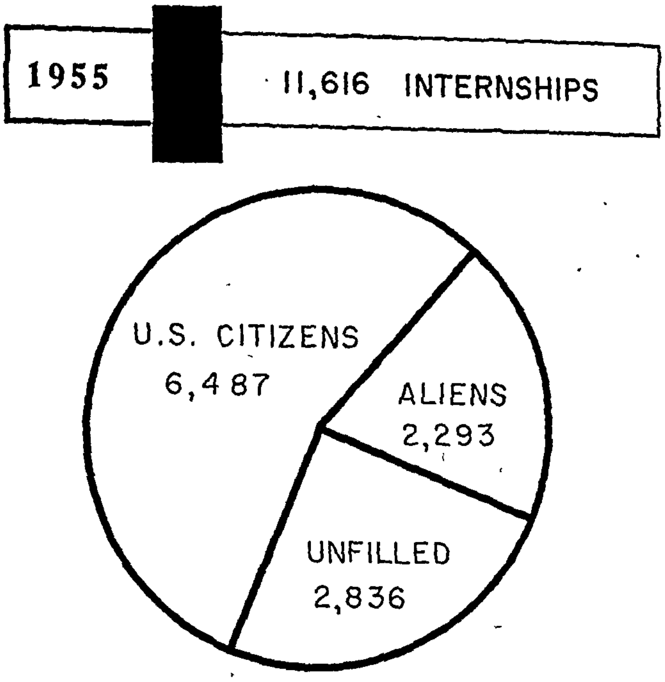

Fig. 20.—Unfilled internships and positions filled by alien physicians present problems that deserve careful study.

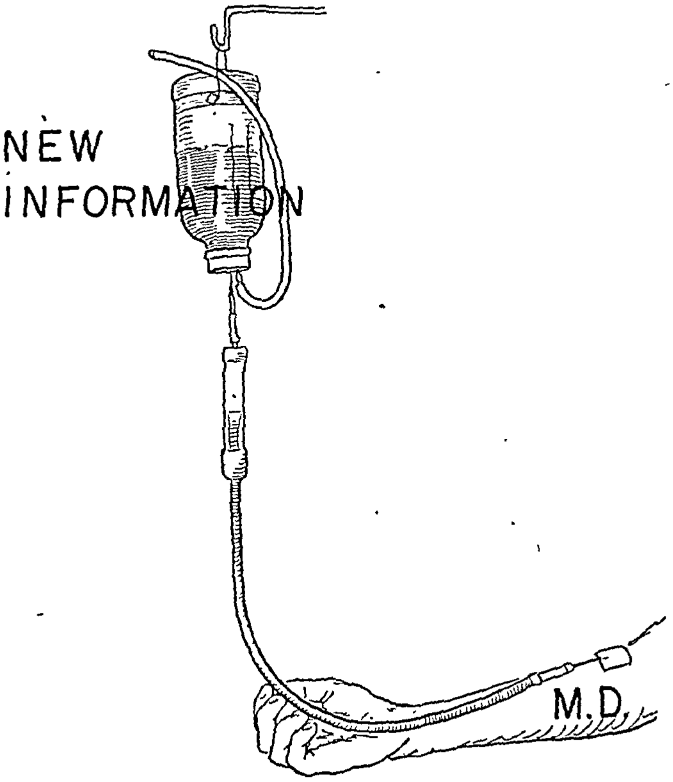

Fig. 21.—Better means must be devised for postgraduate education of physicians.

and speak well of each other, they may hope for an improvement in public attitude toward their profession.

OPINION ABOUT OTHER DOCTORS -	- NUMBER OF M.D.'s HOLDING IT
NOT AS DEDICATED TO SERVING MANKIND AS THEY SHOULD BE	23 %
HARD TO REACH FOR EMERGENCY CALLS	32 %
HAVE THE IDEA THEY ARE ALWAYS RIGHT	36 %
KEEP PEOPLE WITH APPOINTMENTS WAITING LONGER THAN NECESSARY	27 %
NOT ENOUGH PERSONAL INTEREST IN THEIR PATIENTS	21 %
DON'T GIVE THE PATIENT AS MUCH TIME AS THE PATIENT WOULD LIKE	80 %
NOT FRANK ENOUGH IN TALKING TO PATIENTS ABOUT THEIR ILLNESSES	46 %
THEY THINK THEY ARE BETTER THAN MOST PEOPLE	28 %
MOST DOCTORS TRY TO HIDE OTHER DOCTORS' MISTAKES	58 %

Fig. 22.—Physicians have a poor opinion of themselves.

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CHANGING CHARACTERISTICS OF OUR ECONOMY AND THEIR IMPLICATIONS IN MEDICAL EDUCATION

REPORT OF WORKSHOP-CONFERENCE

Leonard W. Larson, M.D., Bismarck, N. D.
and
John Z. Bowers, M.D., Madison, Wis.

The workshop conference on Changing Characteristics of Our Economy and Their Implications in Medical Education first studied the economic trends considered most significant. The standard of living doubles every 25 to 30 years. There has been a leveling process in regard to the financial status of the individual, and the "underprivileged" class is disappearing. As more people have more money, they demand more medical services, more physicians, more paramedical workers, and more hospitals. Increased demand by the consumer is a most significant implication of the changing characteristic of the economy. The steady shift from farm to industry is associated with a sharp increase in income and doubling of per capita income.

Vice-Chairman, Board of Trustees, American Medical Association (Dr. Larson), and Dean, University of Wisconsin Medical School (Dr. Bowers).

Members of the Workshop-Conference on Changing Characteristics of Our Economy and Their Implications in Medical Education included in addition to the Chairman (Dr. Larson) and the Rapporteur (Dr. Bowers) the following individuals: Warde B. Allan, M.D., associate professor of medicine, Johns Hopkins University School of Medicine, member, Council on Medical Education and Hospitals, A. M. A.; Eugene N. Beesley, LL.B., president, Eli Lilly & Company; F. R. Bradley, M.D., director, Barnes Hospital, St. Louis; W. Andrew Bunten, M.D., member, Council on Medical Education and Hospitals, A. M. A.; A. J. Carroll, State University of New York, Syracuse, N. Y.; John W. Castellucci, executive director, Blue Shield Medical Care Plans; Kermit Eby, professor of social sciences, University of Chicago Division of the Social Sciences; Charles F. Ferguson, executive secretary, Pennsylvania CIO-CSC Council; Joseph C. Hinsey, Ph.D., director, The New York Hospital-Cornell Medical Center; Leonard W. Martin, Ph.D., Bureau of Economic Research, A. M. A.; Raymond M. McKeown, M.D., member, Board of Trustees, A. M. A.; James Rock, Research Department, American Farm Bureau Federation; Lyle Saunders, associate professor of preventive medicine and public health, University of Colorado School of Medicine; Herman B. Wells, LL.D., president, Indiana University.

The state of chronic inflation which we have lived in, and seem destined to continue to live in, raises problems for educational institutions, including teaching hospitals. Educational institutions cannot pass on the increased costs to the consumer as rapidly as can an operation like the steel industry. As government is the fastest growing business in society, it has great potential effect in medicine. Fifteen per cent of all hospital beds belong to federal agencies. Are they put to the best use for medical education? The workshop doubted it.

The increased consumer demand for health services is accentuated by the increasing prevalence of insurance programs. As a result, people can afford to demand more medical care. With increased prevalence of insurance programs, teaching material, especially for residency training, decreases. As industrialization increases, the availability of individuals to render service decreases, including individuals in the health services.

The present tax structure, which still does not give sufficient recognition to the problems of retirement and health protection for the self-employed (i. e., the physician), may lessen the appeal of medicine as a career. The trend toward the shorter work week places increasing pressure for productivity on the individual while he is actually employed. As a result, diseases relating to tension and anxiety are of growing importance in occupational medicine.

The prevalence of the burden of short-term debt makes individuals reluctant to spend money for health care and for education. Electronic devices seem more important than support of educational institutions. Ninety-five per cent of the national income is spent in the month that it is earned. Complete prepayment, comprehensive medical care, offered preferably through group practice, and consumer concern about quality are the basic tenets of organized labor's attitude on health programs. Each of these raises economic problems.

What Do Economic Trends Mean to Medical Education?

There is a need for greater financial support for all of our medical schools. Confusion exists as to the actual costs of medical education, and efforts at cost accounting should be applied in a number of medical schools. Tuition, of course, only represents a small fraction (10-25%) of the total cost. The balance is made up from private philanthropy (including contributions from physicians), corporate giving, indirect federal subsidy, and tax money for state-supported medical schools.

How Can the Cost of Medical Education Be Met?

Rapid expansion of scholarship programs from private sources, industry, and labor should be encouraged. The workshop suggested that tuition should be increased to more realistic figures to cover a larger percentage of the total cost. It was agreed that higher tuition figures would not impose an undue burden on many families and students. However, scholarships should be sufficient in number and amount to cover higher tuition for those students who are in need of help.

Probably many well-qualified young people are diverted to other careers because of the high cost of medical education, the long period of training, and erroneous reports on the difficulty of gaining admission to medical school. These comments emphasized to the workshop the need for more intensive efforts at informing the public of the actual opportunities in medicine and the cost of medical education. Such efforts would encourage individual and corporate giving. The geographical restrictions imposed on many state-supported schools were considered to be serious deterrents to affording opportunities to well-qualified students. There was agreement that a large share of the cost of medical education today is born by indirect federal subsidy. Extension of federal programs to direct, continuing subsidy would be unwise because of the inherent dangers of "federal control."

Economic trends, especially consumer demand, and population increases will undoubtedly result in a need for more physicians. Part of this need will be met by new schools now under construction or in planning stages. The American Medical Association and the Association of American Medical Colleges should counsel with representative university administrators to objectively appraise the desirability of indicated expansion of enrollment in existing schools. Expansion of enrollment to maximum desirable levels might actually lower unit costs. Obviously, this could only be accomplished through the availability of more money and more teachers. Reasonable expansion of existing schools would be preferable to indiscriminate development of costly new schools.

Recurrently, the need for a more positive approach toward communication between medicine and individuals representing the other groups concerned with our economy was emphasized. The need for action in this respect is obviously urgent.

221 Fifth St., N. (Dr. Larson).

CHANGING CHARACTERISTICS OF SOCIETY

REPORT OF WORKSHOP CONFERENCE

Julian P. Price, M.D., Florence, S. C., Russell A. Nelson, M.D., Baltimore
and
W. Clarke Wescoe, M.D., Kansas City, Kan.

This workshop conference on "Changing Characteristics of Society" is indebted in great measure to Parsons' magnificent presentation earlier in the day. The members had before them a preliminary agenda but exercised their prerogatives as free American citizens to dispense with such a formal and restraining document. However, the report as finally assembled does bear some relationship to the items of the agenda, a tribute, perhaps, to the flexibility of phrasing of the original notes.

Sociological Trends

The first question to which the members addressed themselves was, "What are the most significant sociological trends?" We were agreed that most prominent among these trends was a continuing emphasis on industrialization in American society. Of equal importance was considered to be the continuing trend toward suburbanization, a trend away from both relatively isolated rural life and relatively compact "big city" life. The third sociological trend of importance was considered to be the more or less migratory manner of modern life, perhaps a symbolization of the restlessness of the day but more probably a result of the industrialization (with its consequent transfers and attraction of personnel) and the press toward suburbanization. The fourth impressive sociological trend was thought to be a continuing emphasis on early marriage.

Results of Trends

The trends toward continuing industrialization and suburbanization have already reflected themselves in part on medical education. They seem not to impose great needs on medical education for change; rather they seem to have wrought a change themselves. Coincident with these trends and in part a result of them has come the increase in third-party payment in medicine and a decrease in ward or charity services in hospitals.

The importance of health insurance programs and their increasing magnitude has been one result of our changing society. The concept of "insurance" in these programs appears to differ from the usual one. If these are to survive we believe they need to be reevaluated, that casualty type polices may need to replace prepayment plans. If they do not, costs will continue to soar. Presumably the answer here, too, lies in public education. There are very few determined to die just to cash in on their life insurance premiums; there are very few who deliberately seek accidents to cash in on their automobile collision policies; there are very few who burn down their homes in order to "get their money's worth" out of fire insurance. Yet the majority of policy holders appear determined to cash in every year on their health insurance.

In many schools today, clinical teaching is carried on with the cooperation of "paying" and "private" patients. Indeed in some schools today the clinical teaching could not be carried on without such patients, and tomorrow it may be true in all schools. It is our feeling that quality medical education will not suffer because of this. There is nothing educationally unsound in the use of intelligent, paying, private patients for teaching purposes. They have common ills, and they are the obvious type of patient for whom the student will be largely responsible in his active professional career. The implications of these patients as the predominant source of teaching material pose real problems, however, in graduate medical education. These problems were discussed in another program this morning and need not be repeated here.

Although it was our feeling that quality medical education would not suffer with the increasing utilization of paying and private patients as teach-

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Secretary, Board of Trustees, American Medical Association (Dr Price); Director, the Johns Hopkins Hospital (Dr Nelson), Dean of the School of Medicine and Director of the Medical Center, Professor of Pharmacology and Experimental Medicine, University of Kansas, and member, Council on Medical Education and Hospitals, American Medical Association (Dr. Wescoe)

Members of the Workshop-Conference on Changing Characteristics of Society included in addition to the Chairman (Dr Price), Co-Chairman (Dr. Nelson), and Rapporteur (Dr. Wescoe) the following individuals Joseph Ackerman, Ph D., managing director, The Farm Foundation, Andrew W. L. Brown, assistant director, Community Services Department, International Union, United Automobile, Aircraft and Agricultural Implement Workers of America–UAW; W Glenn Campbell, Ph D., director of research, American Enterprise Association, L T Coggeshall, M D, dean, University of Chicago Division of the Biological Sciences, president, Association of American Medical Colleges, Cleon A. Nafe, M.D, member, Board of Trustees, A. M. A, associate professor of surgery, Indiana University School of Medicine, Willard C. Rappleye, M.D, dean, Columbia University College of Physicians and Surgeons, Julius B Richmond, M D., professor of pediatrics, State University of New York Upstate Medical Center, William P. Shepard, M D., chairman, Council on Industrial Health, A. M. A., Charles T. Stone, M D., professor of internal medicine, University of Texas Medical Branch, member, Council on Medical Education and Hospitals, A. M. A., Payson S. Wild, Ph D, vice-president and dean of faculties, Northwestern University, William R. Willard, M D., vice-president and dean, University of Kentucky Medical Center ing cases, it was recognized that the public as well as the practicing profession would have to be educated to this necessity so that the cooperation of both these groups might be gained. It was recognized that many groups (industrial and labor) would be useful in helping medical education gain this cooperation.

With the continuing increase in industrialization there will be a continuing need for higher quality industrial health programs. The medical student should be made aware of these problems and should be made aware, as well, of the career possibilities of industrial health.

Expectation by Society of Health Resources

The workshop group next addressed itself to the question, "What kind of health resources will society expect to be available?" We were in unanimous agreement that the movement to suburbanization and the increasing number of young families will lead to a greater need for family physicians in contrast to specialists in narrow fields. Granted that there will be an increasing need for well-trained family physicians, it was not our opinion that this family physician would be entirely akin to the family doctor of bygone days. The very mobility of the family, the migratory trend, may well make family practice extremely frustrating. The ability to learn all of the family's problems in an industrial society will be seriously restricted and the family's counselor in health matters may change frequently in the course of a few years.

The workshop members were agreed that much of medical practice in the future would be in groups and that, in turn, the group would be based on several family physicians. The role of these physicians in our changing society was pictured as differing from the role of today's physician in an urban community. We pictured this family physician as being less hospital-centered and less oriented toward acting in a consultant capacity; we pictured him as clinic oriented, calling upon consultants in urban medical centers when such consultation was necessary.

We felt, in addition, that this physician would be community-related, that is to say one who played a prominent role in community life. We look upon him as a well-rounded physician aware as well of social change as of medical progress. This social awareness will result from greater emphasis on the behavioral sciences in medical education, an emphasis already apparent and continually increasing.

What about personal characteristics of physicians as considered essential by society? None of us was able to define these characteristics, but we agreed that essentially they came close to being those assigned to the deity. Society, we feel, will want the physician to be a professional man of great skill, intelligent and wise, forebearing and forgiving, gentle and kind, a family man, but willing to leave his home at another's call, as well as to be a civic leader and a force for progress in the community. Probably no other group is expected to have these characteristics. The medical student's motivation, therefore, is all-important, and his every day in formal schooling must stress continually the philosophy of dedication to service.

Relationship of Physician to Public

The workshop group felt that there needed to be community education toward the role of the physician. We are convinced that no other profession is as profoundly introspective as medicine, a profession that has given so much and promises to give even more. There appears to be general agreement that American medicine has reached a point never before approached by any system, that American medical education has reached a pinnacle. Yet intensive soul-searching and thought of necessity continue. We are not convinced that the general public is aware of this. We are not convinced that the public appreciates that medical schools decry so-called premedical curriculums; that medical schools prefer those preparing themselves for admission not to segregate themselves from their fellows at an early period in college. We are not convinced that the general public appreciates that medical schools encourage a broad liberal arts education, that they have places for majors in history and sociology as well as in chemistry, that they have reduced their specific requirements in order to allow for this broadened collegiate education. We are not convinced, further, that the general public is aware of the fact that medical schools are stressing the behavioral sciences and social aspects of illness. We believe that the general public must be made aware of these matters.

Further we believe that in some way the public must be educated to know better the role of the physician in order that his energies may best be conserved and his abilities most efficiently used. In many areas the public has come to know that the time the doctor has to spend in his car is wasted as medical service; further it has come to appreciate the fact that the physician can operate more efficiently in his office or clinic facility than at the bedside in a home. If this educational process can continue, our medical talents will be put to better use—more will be served by fewer physicians.

And this brings us finally to what for want of a better name we can call a discussion of the "numbers game." As the law frowns upon the "numbers rackets" so we think medicine should frown upon engaging in a similar pastime. Admittedly there are those who find great security in reducing all terms to numerical designations; there are even those who make their living by it—and stupefy us in the bargain. We are not convinced that anyone knows (or ever will) if there is an optimal ratio of physicians to population. We are convinced that a reporting of such a finite figure can be harmful to medicine. It is fairly obvious that this figure must vary with types of population as well as with availability of *paramedical personnel. We suggest that some* agency set about a proper evaluation of this matter. We suggest, with all the advances that have been made in preventive medicine and rehabilitative medicine, that one physician today may properly care for twice as many patients as his predecessor did 25 years ago—and we suspect that the ratio may become even higher in the future. Indeed with more physicians practicing as generalists and with a redistribution of specialist skills, we think that the numbers we cling to today may have but little meaning tomorrow. It was our consensus that mere addition and multiplication of present numbers may lead to figures with no meaning and, at best, figures that are highly inflated.

We regret, but feel we must mention, the fact that we live today in a period of international tension that beclouds our national problems. However, we feel that we can keep pace with our changing needs if we thoughtfully give attention to our problems, as we are in these few days. We suggest the need for further conferences such as these—and for the wide dissemination of the results of these deliberations.

117 W. Cheves St. (Dr. Price).

POPULATION CHARACTERISTICS AND TRENDS

REPORT OF WORKSHOP-CONFERENCE

John W. Cline, M.D., San Francisco
and
Vernon W. Lippard, M.D., New Haven, Conn.

About a year ago I participated in a conference here in Chicago which was organized by the National Fund for Medical Education. The task assigned to me was to summarize the financial status of American medical education and, in broad strokes, to anticipate its future financial needs. The time allotted was 15 minutes, in the last one of which I estimated that if the population of the United States rose from the present 170 million to *220 million* by 1975, as predicted, and the current physician-population ratio was to be maintained, the rate of production would have to be increased proportionally. The simple algebraic equation used was $170:200=7,000:X$. (Current graduating classes number about 7,000.) X equaled about 9,000, so I said that we should probably have to produce about 2,000 more physicians a year, unless we are to depend largely on importation, and that would require the establishment of about 20 more medical schools. This statement reached the newspapers promptly and thereby I became an expert!

Now I do not pretend to be either a mathematician or a sociologist, and I am not so naïve as to believe that such a complex social problem can be solved that easily. Consequently, I am very glad to have had an opportunity in the past day to take part in a program which would analyze it more rationally.

Associate Clinical Professor of Surgery, Stanford University School of Medicine and Member, Council on Medical Education and Hospitals, American Medical Association (Dr. Cline), and Professor of Pediatrics, Yale University School of Medicine (Dr. Lippard).

Members of the Workshop-Conference on Population Characteristics and Trends included in addition to the Chairman (Dr. Cline) and the Rapporteur (Dr. Lippard) the following individuals: James Brindle, director, Social Security Department, United Automobile Workers; Edwin L. Crosby, M.D., director, American Hospital Association; Frank Dickinson, Ph.D., Bureau of Economic Research, A. M. A.; C. Manton Eddy, vice-president and secretary, Connecticut General Life Insurance Company; Harlan English, M.D., member, Council on Medical Education and Hospitals, A. M. A.; George M. Fister, M.D., member, Board of Trustees, A. M. A., clinical lecturer in surgery, University of Utah College of Medicine; Edwin S. Hamilton, M.D., chairman, Board of Trustees, A. M. A.; Clifford M. Hardin, Ph.D., chancellor, University of Nebraska; Matthew R. Kinde, M.D., director, Division of Medicine and Public Health, Kellogg Foundation; Charles Manning, vice-president, Towers, Perrin, Forster and Crosby; Aims C. McGuinness, M.D., special assistant to the Secretary for Health and Medical Affairs, Department of Health, Education, and Welfare; Robert Straus, Ph.D., professor of medical sociology, University of Kentucky Medical Center; Arthur F. Wileden, Ph.D., professor of rural sociology, University of Wisconsin College of Agriculture; John B. Youmans, M.D., dean and professor of medicine, Vanderbilt University School of Medicine.

The demographic facts, as presented by Kirk, are obvious. Each year we add about 3 million people to our population. Redistribution is taking place and major growth occurring in the West. More people are living in suburbia and exurbia. The population is more mobile. The number and proportion of older citizens will advance steadily. There is a persistent decline in the proportion of unskilled and agricultural workers and a corresponding upgrading of the population in terms of income, occupation, and education. These were the facts presented to us, and the challenge was to interpret them in terms of the future need for physicians.

Demographic Facts

Members of the workshop on population characteristics and trends interpreted our assignment to indicate that we were to be more concerned with numbers than the other groups, but some invasion of their territories was unavoidable. We also soon became aware that, significant as the demographic facts which I have cited may be, there are statistical considerations peculiar to the physician population which must also be taken into account.

Historical Trends.—We decided very early in our discussion that a problem of this sort must be considered in historical perspective. The social, economic, and scientific trends with which we are concerned are not new ones which start today, but rather they have been in progress for a long time. Improved transportation and communication resulting from the automobile and the telephone have been with us with gradually increasing effectiveness for over half a century. The conquest of infectious diseases resulting from improved sanitation was under way at the turn of the century. Immunological methods, such as those for prevention of diphtheria, had come into common usage by the 1920's. Sulfonamides have been available for 20 years and the antibiotics for 15. But the remarkable fact is that the number of physicians per 100,000 population has remained fairly constant over this entire period. By 1920 it was 137, in 1940 it was 133, and it was still 133 in 1955. In other words, although the number of physicians licensed each year has been greater than the number who died, the difference has been just great enough to maintain pace with the increase in total population.

It has been conjectured that as ancillary health workers become available the need for physicians will be diminished, but that trend has also been established for 50 years. In the period 1900-1950, the number of physicians increased by 58%, while over the same period the total number of trained health personnel, including dentists, nurses, and pharmacists, increased by 370%. If this remarkable increase has diminished the need for physicians' services, it is not yet apparent.

Some of the physician members of the panel were of the opinion that doctors could carry larger patient loads than they do today and thus fewer may be needed. It was pointed out, however, that the average number of hours they work per week exceeds that in practically every other occupation. We also noted that there is a strong trend toward group practice which may result in providing better service around the clock yet fewer work hours per week by the average member of the group. One of the lay members of the panel asked whether doctors considered it immoral to share responsibilities, engage in actual practice fewer hours per week, and spend more time in study, thereby keeping up with advances in medical science.

Distribution.—It was inevitable that the question of distribution should arise, and it did. It was generally conceded that there is a shortage of physicians in some rural areas, but that this deficiency is being overcome gradually and that in a few large cities where several medical schools are located there may be an oversupply in terms of current demands for medical service.

Demand Versus Need

The question of demand versus need occupied a good deal of our attention. Demand was interpreted to mean the amount of medical service that people ask for without prodding and can afford to pay for. Need was defined as the amount of medical service, preventive and curative, necessary to provide optimal health for all the people. Now these are two quite different considerations. It is quite conceivable that in time these two curves may merge. There are many recognizable influences, such as improved social and economic conditions, more education, and medical care insurance, which tend to increase demand. On the other hand, such factors as improved living conditions and better diet may diminish the need.

A good deal of evidence was produced to indicate that the two curves are still apart and will continue to be for many years to come. An example was cited of an area of the United States in which there were a million people and no pediatrician, obstetrician, or psychiatrist. Infant and maternal mortality were at a level several times the national average. The local doctors were busy but meeting the demand. They were, however, obviously not meeting the need. Hospitals were built and 40 full-time physicians brought in to staff them. They soon became busy; the doctors who were there previously continued to be busy. Thus, when the service was made available, the demand increased and more nearly approached the need.

We reached the conclusion that the demand has been about in equilibrium with the supply, but we really have no reliable data on which to base an estimate of the need. This led to discussion of techniques for obtaining such information. The very few studies which have been conducted have not been entirely satisfactory, but new epidemiological techniques are being developed which could be applied to this problem. For example, a sample of the population could be examined and the difference between the amount of medical care they are demanding and receiving and the actual need for service to restore and maintain optimal health, within the limitations of our knowledge and skills, could be determined. These data balanced against the capacity of various types of health workers to provide the needed service could produce significant data. Such a study would be extensive and difficult but no more so than our effort to understand the chemical processes which control multiplication of cells and may lead to the chemotherapeutic control of cancer.

Physician-Population Ratio

With all this discussion as a background, the chairman asked this question: "Is the physician-population ratio which has existed over the past 50 years a reasonable basis on which to estimate production of physicians for the future?" He recognized that all he was asking for was an "educated guess" but also that there would seldom be an opportunity to obtain such a guess from a group of experts representing such a broad spectrum of interests as there were around that table at the moment—practicing physicians, medical educators, sociologists, labor executives, hospital administrators, university presidents, business leaders, economists. Only 2 of the 20 were of the opinion that a lower ratio would be satisfactory. The remaining 18 thought that the ratio should be equal or greater or were unwilling to venture an opinion.

The chairman summarized this informal "opinion poll" as follows:

1. Although the physician-population ratio may not be the best measure for future planning for medical care, it does constitute the best measure which can be brought to bear on the problem at this time. 2. Since the level of medical care provided by the existing ratio is reasonably satisfactory, although by no means ideal, until we have a better measure of future needs it would be prudent to pursue that ratio in planning for the production of physicians over the next several years. (One of the representatives of business made an interesting comment in this regard. He said that we are dealing with a problem of continuing and variable opposing forces and that it is a general policy in business organizations not to change course until rather definite indications are perceived.) 3. Under no circumstances should we advise or plan a course of action which would do anything to cause a deterioration in the quality of medical education, but rather we should resort to every measure at our command to improve it.

Having reached these conclusions, we turned to the question of supply of college students available for increased medical school enrollment. Although the attraction of engineering and other scientific endeavors was recognized, we were consoled by the fact that while we may be considering an increased demand for 2,000 students per year by 1975, college enrollment will double, that is, there will be 3 million more students in college in 1975 than there were in 1950. We should be able to squeeze 2,000 out of that number.

Estimate of Foreign-Trained Physicians.—We also considered the extent to which we should plan on importation of physicians trained in foreign schools. The most reliable index appears to be the number licensed each year rather than the number engaged in internships and residences in the United States. This number has ranged from 700 to 900 in recent years. A conservative estimate is that there will continue to be 750 physicians per year trained in foreign schools, including Canada, introduced into the American medical profession annually. If this is true, the proposed increase in enrollment by 1975 may be decreased to 1,250.

Other Questions

Establishment of New Schools.—In planning the establishment of new schools, trends in distribution of population should be considered. It would appear logical that emphasis be given to establishment of schools in areas of rapidly increasing population. Although the mobility of recent graduates is recognized, this appears to be less true of the graduates of the western state universities than of the private schools located in large eastern and midwestern cities. There was general agreement that the most important factor in determining the location of new schools is the desirable climate which results from intimate association with a good and stable university.

Effects of Social and Economic Factors on Curriculum.—There was little time for consideration of the effect of such social and economic factors as suburbanization on the medical curriculum. Although people living in suburbs are likely to suffer from the same diseases as people living elsewhere, such communities may offer a fertile field for group practice and this, in turn, may lead us to structure our curriculums with that type of practice in view. The importance of creating a sensitivity or empathy for the way of life of the prospective patients of our graduates was emphasized.

Conclusions

In summary, we concluded that we do not know all the answers but that the problem of increased production of physicians, at least sufficient to maintain pace with the increasing population, is an urgent one. This will require the establishment of additional medical schools. In planning their location and curriculums, sociological and scientific trends, not just chance and tradition, must receive major consideration.

INFLUENCE OF CHANGING DIMENSIONS OF MEDICAL KNOWLEDGE UPON MEDICAL EDUCATION

REPORT OF WORKSHOP CONFERENCE

Donald G. Anderson, M.D., Rochester, N. Y.
and
Victor Johnson, M.D., Rochester, Minn.

In assessing the influence of changing dimensions of medical knowledge upon medical education, the workshop participants considered their assignment to be the formulation of questions without necessarily providing answers or solutions to the questions in the limited time available for this discussion. The thinking of the group was directed not only toward the influence of the extensive new knowledge and discoveries of recent years but also to the anticipated influences of possible future expansions and new dimensions of medical knowledge.

While certain general aspects of the education of the physician were considered, the main problem was felt to be the content of the basic medical school curriculum supplemented with internship and residency training. The group was primarily concerned with the specific definitive training of the physician rather than the general education of any citizen or any member of a learned profession. The essentiality of a sound general education for everyone was agreed upon but was considered not to be a primary concern of this group.

Premedical Education

However, the preliminary education of the physician prior to his medical education was discussed as regards the apparent discrepancies between present theory on the one hand and practice on the other hand with regard to requirements for entrance into medical school. Lip service is given by medical schools to the desirability of a broad general education and an avoidance of the requirement of excessive scientific premedical preparation. Yet it is common knowledge or general belief that medical school admissions committees are inclined to pay a great deal of attention to the specifically scientific preparation of the medical school applicant and to the level of his performance in these scientific subjects. The question which poses itself here is as follows: How can the theory and desirability of variability in premedical preparation be translated into practice in planning premedical education and in the evaluation of applicants by medical school admissions committees?

It is deplored that there is a monotonous uniformity in the kind of educated individual who enters medical school. How can a greater diversity of education of premedical students be effected, so that students entering medical school will be endowed with a variety of educational backgrounds?

Dean, University of Rochester School of Medicine and Dentistry (Dr. Anderson); Director, Mayo Foundation for Medical Education and Research and member, Council on Medical Education and Hospitals, American Medical Association (Dr. Johnson).

Members of the Workshop-Conference on the Influence of Changing Dimensions of Medical Knowledge upon Medical Education included in addition to the Chairman (Dr. Anderson) and the Rapporteur (Dr. Johnson) the following individuals: James Z. Appel, M.D., member, Board of Trustees, American Medical Association; Ray E. Brown, superintendent, University of Chicago Clinics and Hospitals, professor of business, University of Chicago; John M. Brumm, director of education, International Association of Machinists; Guy A. Caldwell, M.D., Department of Orthopedics, Ochsner Clinic, member, Council on Medical Education and Hospitals, American Medical Association; Lester J. Evans, M.D., executive associate, Commonwealth Fund; Robert H. Hamlin, M.D., assistant to the secretary, Department of Health, Education and Welfare; Thomas H. Hunter, M.D., dean and professor of internal medicine, University of Virginia School of Medicine; Hugh H. Hussey Jr., M.D., professor of medicine, Georgetown University School of Medicine, member, Board of Trustees, American Medical Association; Lawrence A. Kimpton, Ph.D., chancellor and professor of philosophy, University of Chicago; Albert V. Whitehall, Health Insurance Council.

Diversity in Medical Education

One of the major problems to which the workshop addressed itself was that of the quantitative content of the undergraduate medical curriculum, which now requires a tremendous effort at learning vast quantities of detail in all the varied disciplines of basic medical sciences and the special fields of clinical medicine. It is becoming increasingly apparent that it is impossible for students and faculties to attempt to incorporate all the new knowledge, discovered at a rapid rate, with the older, well-established information traditionally a part of the medical curriculum. A major question to be solved is this: How can the total content of the medical curriculum be modified to reduce the great quantity of detailed information now apparently deemed essential?

Not only should there be drastic reductions in the quantity of learning of detail required for all medical students, but perhaps there might also be a considerable degree of flexibility in content of the curriculum for students of varying interests. For example, we might ask: should it be possible for a student who may be especially interested in biochemistry to take extra work in this area at the expense of time and quantitative learning requirements in other basic science disciplines? Again, we might ask: Should not the curriculum be modified on the basis not necessarily of the plans of the student for his future practice and life work but rather on the basis of his immediate interests, inclinations, and curiosities?

Perhaps, in addition, there should be considered the possibility of other sequences in the medical curriculum which are definitely determined by the future plans of the student. Should his experience in medical school be modified somewhat if it appears reasonably certain to him that he will engage in a career of teaching and research rather than of private or group practice? Everyone recognizes that students should not prematurely be encouraged to determine the specialty in which they will permanently engage, yet perhaps there should be considerable flexibility determined in part by the possible future plans of the student.

Perhaps the concept should be abandoned of seeking to produce a single uniform product at the end of the medical school training. Is it essential that every medical school graduate should be able to cope with virtually every common medical problem? Perhaps this concept should be discarded, because physicians no longer are likely to encounter all types of medical problems alone and unaided by associates. Because medical practice will become more and more an enterprise of teams of physicians, might it not be feasible and desirable to eliminate significant masses of knowledge now required of all medical students?

In the light of the vast increases in medical knowledge in the immediate past and anticipated in the future, we will probably have to settle for a considerable degree of ignorance in specific areas by medical students and beginning physicians. We will have to determine how much ignorance we shall accept and in what fields we are willing to accept it in medical school graduates.

It is a commonly accepted general principle among medical school graduates and physicians that completion of the present medical curriculum does not in actuality prepare the physician for training in all fields of medicine as defined by licensure laws. Further training is dictated by the conscience of the individual physician and the profession rather than by law.

To what extent can medical education profit from the educational practices in other professional disciplines, such as law? In the field of law, the educational process is devoted primarily to broad principles and to ways and means of seeking solutions to specific legal problems. In legal education, there is no effort to teach the future lawyer how he should manage all the great array of legal problems which will confront him in his practice of law.

To what extent is this educational principle applicable in medical education? To what extent can we safely depart from the present theory that medical students must be educated to cope with all the various specific common medical problems confronting the general practitioner of medicine?

The question presented may be formulated in another way: To what extent are we now overeducating physicians in medical school? To what extent should we abandon the hopeless effort at complete coverage of all that might seem necessary for the physician to learn? In a very real sense the posing of such questions is academic, because the rapid expansion of medical knowledge is forcing us to abandon the concept of complete coverage and the principle of overeducation. Should not our policy in this regard be developed in a planned, orderly fashion rather than by the unplanned dictates of immediate necessity?

Nonmedical Influences on Medical Education

There is an expanding sphere of influence upon medical schools and medical education by interests outside medical schools and even outside the medical profession. These influences have not come into being through studied decisions but rather as a by-product of various factors influencing medical schools. Grants made for research by private foundations and government agencies greatly affect the research directions of medical schools and consequently the composition of the medical school faculties. This, in turn, influences the constitution of the medical curriculum.

The traditional pattern of the organized medical profession and the various specialties likewise makes its imprint on the emphasis and composition of the medical curriculum. The demands of local governmental agencies for various types of medical service also colors the curriculum. The important problem of how nonmedical factors influence education deserves intensive study so that these influences might not operate by fortuitous circumstance despite possible violence done to sound principles of medical education.

A great deal of study should be given to what should be the appropriate balance between such varied functions and responsibilities of a medical school as teaching, research, and medical service. This balance is now often determined not by a rational analysis of educationally desirable ends but rather by the exigencies of immediate circumstances. A tremendous weighting of emphasis upon research may be dictated by the ready availability of research funds rather than a considered determination of the relative effort that should be expended upon research and education in medical schools. Similarly, the real or fancied necessity for medical school faculties to provide service in the care of the sick in charity hospitals may determine the size of the medical school hospital and may result in an unduly excessive demand for the care of patients by faculties at the expense of training of physicians. In some schools this is reflected in the policy of assigning to medical students all patients admitted to the hospital regardless of total numbers assigned or appropriate variety in kinds of cases assigned. Intensive study is indicated upon the extent to which such influences, not essentially medical or educational in themselves, determine medical educational policies.

Dissemination of Knowledge About Medical Education

Because of these indirect influences on medical education, it becomes essential that the sources of such influence be informed about the aims and needs of medical education. Even within the medical school proper, such education appears necessary. Although the dean and other administrative officers may plead the case for funds available for general educational purposes, it is not uncommon to have members of the faculty of the medical school urge granting bodies that money be given not for general educational purposes but for some specific research area or project.

The necessity for a broader appreciation of medical school aims and needs extends to legislators, public officers responsible for the operation of government hospitals, the administrators of medical insurance plans, and the general public. It is particularly essential that people generally be made increasingly aware of the necessity to support medical education as such in addition to supporting research in cancer, heart disease, or poliomyelitis. It is axiomatic that research and progress in those important areas of medicine depends upon sound programs of medical education which produce the investigators and practitioners involved.

How can devices be evolved for capturing the imagination of the public to support the training of physicians in a measure comparable to the appeal which can be made to the public for the support of programs for crippled children or for such a disease as cancer? Tremendous effort is now being made in this area by the National Fund for Medical Education and the American Medical Education Foundation in cooperation with the medical schools themselves. How can such effort be intensified and made more effective?

Supply of Physicians

The adequacy of the supply of physicians to care for the public needs is in considerable measure a population problem. As the population of the world, and of the United States, increases at its present accelerating rate, the need to provide medical services likewise accelerates tremendously. Even though the control in certain areas of such diseases as smallpox, venereal disease, and tuberculosis decreases the demand for health and physician services, the widened frontiers of medicine open possibilities for medical attack upon conditions formerly thought not to be amenable to medical interference. The advent of intrathoracic and intracardiac surgery, new approaches to mental health, and the increasingly insistent demand for effective control of degenerative disease impose new requirements for augmentation of health personnel.

In the face of constantly increasing demands for medical services, should not consideration be given to an increasing employment of health personnel trained at levels somewhat less than those of the physician? Considerable progress has been made already in this area. Nurses, social service workers, physical therapists, clinical laboratory technicians, and many other groups provide invaluable ancillary services. Should not efforts be made to determine other areas, not presently employed, where medical functions might be provided by personnel trained less extensively and less expensively than is the case with physicians?

The effort to meet such problems is fraught with difficulty. The clinical psychologist or social worker may function admirably in collaboration with the psychiatrist but may be dangerous if he is diagnosing and advising independently regarding marriage or a career. The technician in physical therapy likewise is sorely tempted to enter what is virtually the practice of medicine by determining the nature of the therapy to be employed. Too often this assumption of independence by the physical therapist is fostered by the physician who may be inadequately informed about physical therapy or unwilling to assume responsibility for management of that aspect of the care of the patient.

We are all familiar with the manner in which this principle of using ancillary medical personnel was employed in the emergency of wartime. Well-trained hospital corpsmen carried out functions often thought to lie exclusively within the realm of the physician. In some countries, such as China, and in some of the Pacific Islands, medical technologists were trained to care for patients essentially as physicians. Such developments were commonly dictated by necessity. Should we not explore intensively the possibilities for an orderly and studied development of ancillary services of this kind to supplement the more highly skilled services required of a physician?

Adaptability of Curriculum to Changing Medical Needs

The medical school curriculum should be sufficiently flexible so that changes in the medical climate of a country or the world can be readily reflected in medical school teaching and policies. For example, the recent developments in medicine have made practice in otolaryngology and gynecology less surgical and more medical in nature. To what extent has the medical curriculum adjusted to these changing needs and to what extent is the remainder of the curriculum sufficiently flexible to adjust to even more drastic changes in the medical climate of the immediate future? The surgical management of cancer at present occupies a tremendous share of medical school training and the education of the surgeon. How ready is the medical school to shift its curricular emphasis if the problem of cancer management should be drastically modified by medical discoveries in the immediate future?

Postgraduate Education

The workshop group could have devoted its entire discussion to the vastly important field of continuation education to keep the physician abreast of developments. A renewed vigor has characterized efforts in this area in recent years, by organized medicine and medical schools. Excellent examples are evident in Kansas, Colorado, Minnesota, and California. The theme of the Second World Conference on Medical Education is "Medicine, a Life Long Study." In its plans for this conference next year, the World Medical Association will devote much of its program to the subject of continuation of medical education.

Conclusions

Numerous questions other than those already developed in this report were deemed worthy of inquiry and answers. How can teachers and investigators be more effectively recruited in greater numbers? By what means might provisions be made to finance more satisfactorily the period of study of a medical student? How can we reduce the total period devoted to medical education? How can the supply of family physicians be increased?

The problem now confronting us is the implementation of these initial studies. We have posed questions and must now assiduously seek to find answers. Perhaps this should be done by continuing committees, by more extended workshops devoted to selected questions, or by the appointment of an organized commission to study these problems in detail. Implementation of further study is the responsibility of the agencies sponsoring this meeting.

Throughout the discussion of all these questions, the necessity was plain for medical schools to be integral parts of universities. The solution of the problems posed promises greater success in a university-affiliated medical school. Means of closer integration of faculties of medical schools with faculties of other divisions of the university are necessary even in institutions where medical schools are now located on university campuses.

These are some of the challenges posed by the changing dimensions of medical knowledge upon medical education, with a focus upon future needs. Perhaps we will never answer these questions or solve these problems, but we must persistently seek the answers and attempt to cope with the problems.

INFECTIOUS MONONUCLEOSIS.—Although infectious mononucleosis has been recognized as a clinical entity for at least 67 years, following the clinical description by Pfeiffer in 1889, and even though the hematologic picture was accurately characterized 23 years ago by Downey and McKinley and Tidy and Daniel simultaneously, identifying the lymphocyte as the cell form involved, the causative agent of this disease has not yet been identified. It is axiomatic that specific treatment of a disease is rarely possible without first identifying the causative agent. It is therefore likely that treatment of infectious mononucleosis will remain on a symptomatic basis until the etiologic factor is identified. Although there is rather uniform agreement among workers in this field that the causative agent is a lymphotropic virus, this has by no means been proved. Under the limitations of these circumstances, therefore, the important advances in treatment have been confined to management of the complications.—B. K. Wiseman, M.D., The Treatment of Infectious Mononucleosis, *Journal of Chronic Diseases*, October, 1957.

CLINICAL NOTES

TRIAMCINOLONE (ARISTOCORT), NEW CORTICOSTEROID HORMONE

ITS USE IN TREATMENT OF ALLERGIC DISEASE

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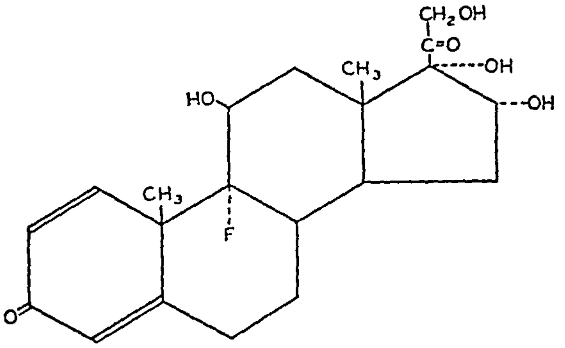
For the 10 months prior to the time of writing we have been observing the effects of a new anti-inflammatory steroid hormone in allergic conditions. Its high potency and the fact that we noted other actions not customarily encountered with the other anti-inflammatory hormones prompt us to report our findings.

This drug, triamcinolone (9α-fluoro-16α-hydroxy-Δ^1-hydrocortisone; Aristocort) was synthesized by Bernstein.[1] The structural formula is as follows:



The major features of the drug, as determined at Lederle Laboratories,[2] are the following: Its glucocorticoid activity is 3 to 12 times that of prednisolone in fasting adrenalectomized rats. Its anti-inflammatory activity, as measured by granuloma formation around asbestos pellets inserted in the backs of rats, is about equal to that of prednisolone and 10 times that of hydrocortisone. The most intriguing action of this drug is the marked diuresis and sodium removal obtained in adrenalectomized rats loaded with salt, as well as in normal rats and dogs. No abnormal removal of potassium is found. Our own assay of this hormone on the inhibition of asthma induced by an antigen aerosol in sensitized guinea pigs showed a potency twice or better than that of prednisone. These experimental findings, added to the favorable therapeutic results in allergies reported by Sherwood and Cooke,[3] were the basis for our clinical study.

Therapeutic Results

Triamcinolone was administered to 70 patients with allergic or suspected allergic manifestations. Because some patients had more than one complaint the total number exceeds the number of patients. The age of the patients varied from 7 to 74 years, 10 of the patients being under age 14. The duration of treatment with this drug ranged from ½ week to 40 weeks, 24 patients being on treatment for 20 weeks or longer. The patients with asthma numbered 52. Most of them had the chronic intractable type of unknown etiology, but a few received treatment during special acute episodes of a seasonal or other unavoidable etiology. Thirteen patients had dermatitis: atopic, contact, or of unknown etiology. Included among the treated patients were 5 with seasonal hay fever and 12 with perennial vasomotor rhinitis. There were four patients with urticaria or angioneurotic edema.

It was obvious from the start that virtually all patients with these conditions would receive relief just as they would with other anti-inflammatory hormones. The major questions at issue were the relative potency of this drug and whether it possessed advantages or disadvantages as compared with others. The initial 24-hour dose varied usually from 8 to 16 mg., although from our experience one cannot definitely say what minimal initial dose was actually necessary. However, with regard to maintenance dosages, our observations give us more accurate information. In the vast majority of patients the dose ranged from 2 to 8 mg., although sometimes larger amounts were required for nasal allergies and dermatoses. The average daily maintenance dose for the entire series was 6 mg. Thirty-eight of the patients also had prednisone previously or subsequently, and 18 had both triamcinolone and methylprednisolone at different times. The average daily maintenance dose in these groups was as follows: for prednisone, 12 mg.; for methylprednisolone, 10.6 mg.; and for triamcinolone, 6 mg.

Other Observations

Triamcinolone behaved like the other anti-inflammatory hormones with respect to their usual side-effects. Of eight patients who had muscle cramps from prednisone or methylprednisolone, all experienced the same symptoms from triamcinolone. It is possible that the latter drug had a little less tendency to the production of moon facies, but

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the difference was not striking. Epigastric distress, relieved by antacids, was noted in three patients. One patient who had hyperglycemia and glycosuria from prednisone and methylprednisolone had similar effects from triamcinolone.

The diuretic effect of this drug was evident in several patients who had obvious edema from other steroid therapy. Several patients who had no obvious edema when on therapy with another steroid experienced increased urinary output and rapid moderate loss of weight, which could only be attributed to water loss, when switched to triamcinolone therapy. Of two patients with edema, probably of cardiac origin, one lost his swelling and the other failed to do so. On the other hand, two patients who had ankle edema apparently on a local circulatory basis retained their swellings.

A unique feature of triamcinolone therapy occurring in some patients was a syndrome consisting of one or several of the following symptoms: headaches, dizziness, drowsiness, and weakness. Sometimes this occurred after the first day or two of medication. At other times the patient failed to note these effects until he had been receiving the drug for several weeks. To a varying degree this syndrome was observed in 12 patients in this series. In some the effects were moderate or disappeared with time. Four patients discontinued the use of the drug because the symptoms were so prostrating that they considered their severe allergies the lesser evil. These symptoms disappear in one to three days after another steroid hormone is substituted. In these patients as well as in those without side-effects the usual laboratory findings were as expected with steroid hormones. The total white blood cell count was elevated, with increase in neutrophils. The usual eosinopenia was noted. The urine did not show evidence of kidney irritation. The blood pressure was decreased slightly but not excessively. The general physical examination failed to show any gross abnormalities. In three patients the addition of supplementary sodium or potassium failed to relieve these particular symptoms.

Loss of weight was common but not universal. In several it was the small loss from the initial diuresis. In others it was a flesh loss as a result of a change-over from an appetite-stimulating hormone to triamcinolone, which has virtually no appetite-stimulating effect. In a few patients there was weight loss even though they had not been receiving other steroids previously. In two nonobese patients the weight loss was alarming, in that both lost about 20 lb. (9.1 kg.) in a matter of several weeks.

Comment

In allergic syndromes the potency of triamcinolone was about two times that of prednisone. This agrees pretty much with our observations in the asthmatic guinea pig. However, when compared with assays of other hormones, the guinea pig assay does not appear reliable. On the other hand the rat assay gives this drug a potency similar to that of prednisone or prednisolone. Black and his associates[4] as well as Hellman and his group[5] have noted that the maintenance dose of triamcinolone in rheumatoid arthritis is about the same as that of prednisone or prednisolone.

The lack of sodium retention is an advantage, particularly in treating allergic patients who also have cardiac disease or hypertension. On the other hand, one cannot help but wonder whether sodium depletion may not reach a handicapping stage. The peculiar syndrome of headache, sleepiness, dizziness, and weakness, occurring in a minority of patients, has not yet been adequately explained.

Summary

Triamcinolone (9α-fluoro-16α-hydroxy-Δ^1-hydrocortisone; Aristocort) is a potent antiallergic hormone, producing therapeutic effects with about one-half the dosage required for prednisone. It produces most of the usual steroid hormone side-effects, such as moon facies, hyperglycemia, muscle cramps, and epigastric distress. Unlike some of the other anti-inflammatory hormones it is diuretic and sodium depleting, which may be advantageous in some cases and perhaps disadvantageous in other circumstances. In a minority of patients a peculiar effect is a combination of headache, dizziness, sleepiness, and weakness. In some cases these effects may necessitate withdrawal of the drug. It does not stimulate the appetite and may even depress it.

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This investigation was supported by a Research Grant from the National Institutes of Health, United States Public Health Service.

The triamcinolone used in this study was supplied as Aristocort by Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

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J.A.M.A., May 3, 1958

COMPARATIVE STUDY OF OPHTHALMIC DECONGESTANTS IN ALLERGIC CONJUNCTIVITIS

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During the past four years, various members of the staff of the Allergy Clinic at Temple University Hospital have been investigating the value and possible usefulness of eye tests with inhalant allergens in the diagnosis of allergic conditions. During the course of these studies, an opportunity was afforded us to compare the effect of different ophthalmic solutions, or decongestants, which are used for instillation into the conjunctival sac in patients with allergic reactions affecting this membrane. It is the purpose of the present paper to report the significant findings of this study.

Introduction of a specific allergen into a sensitized conjunctival sac in the performance of ophthalmic or eye tests produces a positive reaction with the following signs: hyperemia, lacrimation, and chemosis. The patient complains of varying degrees of itching or similar discomfort. When the patient is markedly allergic to the test substance, the reaction is rapid in onset, extensive, and long lasting. Depending on the degree of involvement and the amount of hyperemia, the positive reactions can be graded as strongly positive (3+), moderately positive (2+), or slightly positive (1+). The latter designation was reserved for those reactions with local and sharply bordered bands of hyperemia extending upward on the eyeball toward the pupil. They often are slow in onset and may require as much as 10 minutes to become apparent. Introduction into the conjunctival sac of a similar allergen, but to which the patient is not sensitive, produces no reaction and is considered negative.

If left alone, the hyperemia induced by a positive reaction will go away after a varying interval of one to two hours or longer. However, its disappearance can be hastened by the removal of all remaining particles of the test allergen by means of a cotton-tipped applicator and/or by flushing of the sac with a few drops of sterile saline solution. This will keep the reaction from progressing but will not clear up the congestion. The latter can be lessened by the instillation of one or two drops of an ophthalmic decongestant solution.

Method

Many ophthalmic solutions containing ingredients in varying combinations have been used for instillation in patients with allergic conjunctivitis. Most of them have included the following drugs, either singly or in combination: epinephrine, phenacaine (Holocaine) hydrochloride, ephedrine sulfate, cortisone acetate, and hydrocortisone acetate usually prepared in solutions of boric acid, rose water, saline solution, or Estivin (aqueous infusion of *rosa gallica L*).

These were the drugs which were tested in the present study. For many years in patients with allergic reactions in the ophthalmic membrane, such as seasonal hay fever, we have been using an ophthalmic solution containing the following drugs: phenacaine (0.2%) and epinephrine (4 cc. of a 1:1,000 aqueous solution) in equal parts of rose water and boric acid sufficient to make 30 cc. of solution. This solution nearly always brought about prompt and satisfactory relief of the itching and congestion, but we never were certain as to which of the ingredients was mainly responsible. Our present investigation afforded this opportunity since we were able to test the ingredients of this mixture singly and in combination. This was true also of the cortisone solutions, which are now being employed so frequently in these patients almost to the exclusion of older decongestants. All solutions were tested in their original strength as prescribed for the patient.

The patients used in the present investigation were those in whom eye tests with various inhalant allergens (both pollen and nonpollen) were being carried out. After the completion of the eye tests, those subjects who gave slight or 1+ positive reactions to a specific allergen were selected for the comparative study of the ophthalmic solutions. Whenever possible, these solutions were tried on the same patient at different times or on different days. When not possible, the comparison was made on different subjects but always on those showing 1+ reactions. Two drops of the solution being tested were instilled into the conjunctival sac, and the effect was noted over a period of 10 minutes. Particular attention was paid to any change in the color of the membrane which might indicate lessening of the congestion, to the speed of its occurrence and, finally, to any subjective sensations noted by the patient, such as burning or itching or the relief of these symptoms. These were noted and utilized in the final evaluation of the results.

From the Clinic of Allergy and Applied Immunology, Temple University Hospital and School of Medicine.

Read before the Philadelphia Allergy Society, Philadelphia, Oct. 30, 1957.

Results

A total of 130 comparative tests were carried out on patients showing positive reactions. This total is subdivided as follows: epinephrine (1:1,000, in a proportion of 4 cc. to 30 cc. of solution) and phenacaine (0.2%) in a solution of equal parts of boric acid and rose water, 8 tests; epinephrine in boric acid and rose water, 10; epinephrine in rose water, 25; phenacaine in boric acid and rose water, 7; phenacaine in rose water, 15; phenacaine in boric acid, 9; Estivin, 10; hydrocortisone acetate (0.5%), 12; cortisone acetate (0.5%), 11; cortisone acetate and chlorprophenpyridamine maleate (Chlor-Trimeton), 5; and ephedrine (0.5%) in isotonic sodium chloride solution, 8.

The results obtained with the testing of each solution were fairly uniform and enabled us to determine their efficacy regardless of the number tested. Thus, for example, the instillation of 0.5% ephedrine solution uniformly provided little or no relief, and it was considered so ineffective compared to the other agents that further tests with it were abandoned.

The most effective drug of all unquestionably was epinephrine. Since the allergic reaction consists largely of congestion, the vasoconstrictive action of epinephrine was readily evident. Almost immediately after its instillation, there was rapid blanching and obliteration of the congestion; and, except in patients with marked positive reactions, all symptoms and signs were relieved in less than five minutes. In fact, epinephrine was the only drug which produced lessening or obliteration of the vascular congestion. In the concentration employed, no mydriasis was observed in any of the patients tested. Some patients complained of a slight burning sensation immediately after the instillation of the drops, but this feeling could be minimized by careful administration and by instructing the patient to keep the eye closed for a short time. Rose water seemed to provide the best vehicle. Most patients found the combination of epinephrine and rose water more soothing than epinephrine in boric acid. The latter did not seem to offer any particular advantage over rose water as a vehicle.

Phenacaine, like epinephrine, long has been used in ophthalmic solutions. It was tried alone and in combination with epinephrine. Although no reduction in the congestion was noted, most patients noted lessening of the burning and itching sensation. However, since this and other local anesthetics are potential sensitizers, it is questionable whether the additional use of these agents is warranted, especially if relief can be obtained without it.

The effect of the corticoid preparations tested was difficult to evaluate under the test conditions utilized. After instillation of them into the conjunctival sac, no blanching or lessening of the congestion was noted, nor did any of the patients experience symptomatic relief. It was possible that the beneficial action of these agents is delayed in onset, but evaluation of the latter would have to depend on information obtained at a later visit of the patient—such information would be unreliable. Furthermore, since most positive reactions, even marked ones, subside within a few hours, it would be difficult to determine whether the improvement was spontaneous or the result of the solution used. While the value of the corticoid solutions in chronic inflammatory ocular disorders of varied etiology seems definitely established, our studies have failed to show them to be useful in the acute, self-limited form of allergy reaction.

Estivin is a proprietary product which has been popular with persons with hay fever for many years. Its exact composition is not known, although it is believed to contain an extract of roses. It was included in our studies because of the claim both by the company and by some patients that it provided relief of both eye and nasal symptoms associated with hay fever. The results of the tests with the product were not impressive. Most patients, especially when tested with a pollen allergen, reported slight relief of the itching sensation and a mildly soothing effect. However, inspection of the conjuctiva in these patients failed to show any change in the vascular congestion. From these observations, it seemed to us that Estivin did not have any more beneficial effect than could be obtained from the use of a simple diluent, such as rose water.

Various combinations of the active ingredients and their diluents were tested in a comparative way to determine if there was any synergistic effect. It was found that no combination that did not include epinephrine offered any special advantage over epinephrine when it was used alone. Of the three vehicles used, rose water seemed to be better and more soothing than were boric acid or saline solution.

During the course of our studies, we had an opportunity to determine the effect of aging on the potency of the solutions being studied, particularly those containing epinephrine. We did this by comparing solutions which were six months to one year old with fresh solutions prepared just before our study was begun. Although all solutions were kept in dark-colored, tightly-closed dropper bottles, deterioration occurred in all of the solutions containing epinephrine, indicated by a slight brownish discoloration. Such solutions definitely had less potency than a freshly prepared solution containing epinephrine. It was evident, therefore, that for maximum effect ophthalmic solutions containing epinephrine should be prepared in small amounts and used for only a relatively short period of time.

For intravenous use in support of anesthesia, the drug should be well diluted and administered slowly. For adults, 50 to 100 mg. is diluted with 500 cc. of 5% dextrose in water for injection. Enough of this diluted solution to provide 5 to 10 mg. is then infused slowly. Analgesia is maintained by slow intravenous drip at a rate adjusted to provide about 0.6 mg. per minute, depending on individual need and response. Direct intravenous injection of the concentrated commercial solution should not be attempted except under grave emergency situations when time or facilities do not permit dilution of the drug. If used under these conditions, the rate of injection should be extremely slow, so that the injection takes at least several minutes. It should be borne in mind that the sudden intravenous injection of an amount greater than 10 mg. may cause apnea.

Preparations: solution (injection) 25 mg. in 1 cc., 50 mg. in 2 cc., 750 mg. in 30 cc.

Applicable commercial name: Leritine Phosphate.

Merck Sharp & Dohme, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of anileridine phosphate.

Protamine Sulfate, N. F.—The sulfate salt of a strongly basic substance which is protein-like in nature and which is derived from the sperm of the salmon and other species of fish. Protamine is essentially a large polypeptide which, on hydrolysis, yields arginine or arginine in combination with histidine, lysine, or both.

Actions and Uses.—Protamine sulfate is a heparin antagonist. Paradoxically, the drug itself is an anticoagulant and will cause a prolongation of the clotting time. Although not nearly as active as heparin, protamine may be considered a true antithromboplastin. However, when protamine is given in the presence of heparin, the attraction of the two substances for each other is much greater than their individual attraction to the blood elements. Thus, in a sense, each neutralizes the anticoagulant activity of the other. The quantitative relationship of this interaction, which proceeds both in vitro and in vivo, is that of approximate direct ratios; i. e., about 1 mg. of protamine is required to overcome the anticoagulant effect of 1 mg. of heparin. When given intravenously to a heparinized patient, protamine appears to act almost instantaneously, and its effects persist for about two hours.

Protamine sulfate is well established as an effective agent for combating the bleeding tendency that results from overdosage of heparin. Its intravenous administration results in rapid control of heparin-induced hemorrhage and, if given in sufficient dosage, a restoration of clotting time to normal. The availability of protamine sulfate is therefore essential for the safe management of patients undergoing anticoagulant therapy with heparin.

Protamine has also been used for the treatment of certain nonspecific hemorrhagic states which are believed to be characterized, in part, by increased amounts of heparin or heparin-like substances in the circulation. The rationale for such therapy is based upon the observation that the blood of certain patients, notably those with menorrhagia, postpartum hemorrhage, or postirradiation hemorrhagic diathesis, shows an increased protamine titration. This test is one in which identical aliquots of heparinized blood are added to increasing concentrations of protamine, the end-point being the amount of protamine required for clot formation. Some patients in this diagnostic category have shown decided improvement after the administration of protamine, but there is insufficient evidence at present to prove conclusively that the cessation of hemorrhage in these conditions can be attributed to the action of the drug. Thus, the use of protamine in the treatment of acquired hemorrhagic diseases is considered experimental.

In clinical use, protamine sulfate appears to be well tolerated, and large intravenous doses (up to 200 mg. in two hours) have been administered without any untoward effects. Since it is the additive used in the preparation of protamine zinc insulin, protamine has often been suggested as the causative agent in the hypersensitivity reactions that sometimes occur in diabetic patients receiving that form of insulin. However, experiments have demonstrated that such reactions are due to sensitivity to the insulin rather than to the protamine, and it appears doubtful that allergy to protamine exists to any significant degree.

Dosage.—Protamine sulfate is administered intravenously and, occasionally, intramuscularly. For the treatment of heparin overdosage, a 1% solution is injected slowly (in one to three minutes) by the intravenous route. Since heparin is counteracted approximately milligram for milligram, the total dosage of protamine can be determined from the amount of heparin given over the previous three to four hours. The dosage should not exceed 50 mg. of protamine at any one time.

In the treatment of spontaneous hemorrhagic disorders, the proposed total daily dosage is 5 to 8 mg. per kilogram of body weight, injected in two equal portions six hours apart; the calculated dose is diluted in 300 to 500 cc. of isotonic sodium chloride solution and slowly infused intravenously. Therapy should not be continued for longer than three days.

a triad of clinical signs—disturbance of consciousness, paralysis of eye movements, and an ataxic gait. Since two of his three patients were alcoholics and all of them died, the presence of alcoholism and a fatal outcome came to be regarded as essential parts of the clinical picture. Pathologically, he described focal vascular lesions that primarily affected the gray matter around the third and fourth ventricles and the aqueduct of Sylvius. He regarded the disease as inflammatory in nature and suggested the name "acute superior hemorrhagic polioencephalitis." Wernicke's views have been considerably modified in recent years, although his clinical triad is still useful in diagnosis. The following description is based on our experience with 160 cases of this disease.

The crux of the clinical picture is ocular disturbance, and the *diagnosis of Wernicke's disease,* at least during life, cannot be made without it. This consists of (1) horizontal and vertical nystagmus, (2) paralysis of the external recti, and (3) paralysis of conjugate gaze. Ptosis, retinal hemorrhages, and pupillary abnormalities are occasionally encountered, but we have never observed papilledema in this disease.

Some degree of ataxia is found in almost every patient; however, severe polyneuropathy precludes testing of some patients. Stance and gait are mainly affected, and in its severest form the patient is unable to stand or walk without support. In contrast to the gross disorder of locomotion is the relative infrequency of a clear-cut intention tremor. Ataxia is most likely cerebellar in origin but is often mistakenly attributed to a peripheral neuropathy.

Mental aberrations were detected in all but 10% of our patients. Of the various Wernicke symptoms, these are the most difficult to define, but at least three different types can be recognized. 1. About 20% of patients show the mental symptoms characteristic of delirium tremens or its variants. These symptoms are evanescent and may clear without any specific treatment. 2. A large number of patients, when first seen, are in a state of apathy and severe confusion. Unconsciousness as part of the initial episode is distinctly rare, and drowsiness is not common; the patient's state is better described as one of disinterest and indifference. Under the influence of thiamine or simply an adequate diet, the patient rapidly becomes more alert, attentive, responsive, and more capable of taking a mental test. Then the most prominent abnormality is one of retentive memory, that is, Korsakoff's psychosis. 3. Some patients are alert and responsive from the

polar regions: seen, and they already show the
ray particles in adja of Korsakoff's psychosis.
siderable variations
present no informe
gard to the ionization

Wernicke's disease has an abrupt, almost apop tic, onset. All the symptoms may appear togetl but more frequently ophthalmoplegia and ata precede the mental signs by several days or a we Varying degrees of polyneuropathy occur in o half the cases, and occasionally retrobulbar ne ropathy and spinal spastic ataxia may be prese The incidence of mortality in our patients was 16 most of whom had other serious illnesses, such cirrhosis of the liver or tuberculosis.

The pathological changes in Wernicke's disease are clearly not inflammatory, nor are they limited to the gray matter. The lesions are destructive in nature and affect both nerve cells and fibers. They are symmetrically located in the mammillary bodies and less consistently are located in the paraventricular regions of the thalamus and hypothalamus, the periaqueductal region of the midbrain, and the floor of the fourth ventricle. Hemorrhages are not found in all patients, and when present they do not appear to represent the significant pathological change.

Korsakoff's Psychosis.—Korsakoff's psychosis is generally defined as a state of "memory defect with confabulation." This designation fails to characterize adequately this psychosis. It is apparent from Korsakoff's writings that his patients displayed a much wider range of symptoms, including those of delirium, confusion, and what he termed "irritable weakness" (anxiety, fear, and depression). Our patients showed, in addition to these important features, a wide range of intellectual impairment. On formal psychological testing, they were found defective in concentration, in verbal and visual abstraction, in visual-motor coordination, and in learning ability. Although such a pattern is probably not specific for Korsakoff's psychosis, it emphasizes the fact that there are a number of abnormalities in cognitive function, apart from memory defect, in this disease.

Nevertheless, the unique feature of Korsakoff's psychosis is the disturbance of memory out of proportion to the other cognitive functions. Thus, a few minutes after completing a standard intelligence test, a patient may be unable to recall the examiner or having taken the test. Although recent memory suffers most, this is a relative matter, and remote memory may be defective in severe cases.

Of the various abnormalities related to memory function, two are particularly characteristic. First, the patient has a persistent inability to learn newly presented material, that is, to make new memories. Since adaptation to every new situation requires the formation of new memories, or at least the com bining of new and old ones, it is this defec

common and are very much the same as those of neuritic beriberi. Many of the neurological abnormalities seen in pellagra may be due to deficiency of vitamins other than niacin.

Nutrition in Alcoholic Disorders of the Nervous System

In two major classes of alcoholic disease, namely, acute intoxication and the abstinence syndrome, nutritional factors are of little or no importance. This is at first surprising, since many patients in this category, particularly the spree or periodic drinkers, give a history of poor diet, and a small number may show signs of malnutrition. However, withdrawal symptoms may develop in patients who are adequately nourished. Furthermore, we have observed the subsidence of these symptoms in a group of patients who were denied food or vitamins throughout the course of the withdrawal illness, and in a group who were given water, glucose and water, or glucose-water and minerals as the only nutrients.

The evidence is now overwhelming that polyneuropathy, the Wernicke-Korsakoff syndrome, amblyopia, and pellagra are nutritional in origin and that the role of alcohol is purely secondary. A systematic review of the evidence is beyond the scope of this article, and only the major landmarks in the development of this concept will be mentioned. Brief reference will also be made to the specific factor or factors concerned in the genesis of the nutritional diseases and the mechanism of their action.

Polyneuropathy.—The close association of alcoholism and polyneuropathy has long been appreciated. The articles of Lettsom in 1787 and of Jackson in 1822 are usually quoted in this connection; they do indeed contain accurate clinical accounts, albeit of only the most advanced form of the disease. The concept that polyneuropathy in alcoholics is the result of nutritional deficiency is relatively recent. Only after beriberi became established as a nutritional disorder was the alcoholic etiology questioned. The similarity of neuritic beriberi to alcoholic neuritis was commented on by several authors, but it was Shattuck,[5] in 1928, who first seriously discussed their relationship. He suggested that the "polyneuritis of chronic alcoholism was caused chiefly by failure to take or assimilate food containing a sufficient quantity of vitamin B . . . and might properly be regarded as true beriberi." The most convincing evidence that alcoholic polyneuritis does not result from the neurotoxic effect

polar regions. pplied by Strauss.[6] He allowed 10
ray particles in adja their daily consumption of
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whisky while they were given a well-balanced supplemented with yeast and vitamin B conc trates. Improvement occurred in all the patie

The precise nutritional factors concerned in neuropathy of alcoholism and beriberi are not fully defined. For a number of years after the d covery of thiamine, a debate centered around t question of whether this was the antineuritic vi min. Only a small proportion of the experimen undertaken to settle this point satisfies the strict criteria of the nutritionist; however, there is acceptable evidence that, in the rat, dog, and pigeon thiamine deficiency brings about a degeneration of the peripheral nerves. Swank's[7] experiments on pigeons are particularly convincing since the nerves regenerated when thiamine alone was added to the diet that had produced the neuropathy. The necessity of either accepting or rejecting the specific role of thiamine became less urgent when it was shown that a deficiency of pyridoxine or of pantothenic acid caused degeneration of the peripheral nerves. In humans, there is a small but convincing body of data which show that the clinical signs of neuropathy can be produced by a deficiency of thiamine[8] and, under some circumstances, by a deficiency of pyridoxine[9] or pantothenic acid.[10]

Wernicke's Encephalopathy and Korsakoff's Psychosis.—The identification of Wernicke's disease as a nutritional disorder closely followed the changing ideas in regard to polyneuropathy. The first step in this direction was taken when it was recognized that Wernicke's disease could occur apart from alcoholism, as, for example, in hyperemesis gravidarum or as a terminal event in various cachectic states. Shortly after the appearance of these reports, Alexander and his colleagues drew attention to the similarity of the pathological changes in Wernicke's disease and those which resulted from thiamine deficiency in pigeons.[11] Lesions which are similar to those of Wernicke's disease in their topical and histological character have been repeatedly produced in a large number of species rendered thiamine deficient; the lesions produced in monkeys bear the closest histological resemblance to the human disease.[12]

The specific nutritional factor concerned in most, if not all, of the symptomatology of Wernicke's disease is thiamine. This idea has received confirmation through a number of clinical observations, including our own.[13] We have noted the effects of thiamine and other vitamins on the various components of the Wernicke syndrome; throughout experimental period the patients were kept synthetic diet composed of glucose, min

HE JOURNAL
THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

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Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

TAKING THE HEALTH MESSAGE TO THE PUBLIC

As the ancient Chinese dictum says, one picture *is* worth 10,000 words. Man has always communicated most effectively through graphic presentations, and the health exhibit or health museum *is* a natural expression of man's visual-mindedness.

The health museum and modern exhibit technique first came into their own about the time of the great fairs which were held in the United States, beginning with the Century of Progress Exposition in Chicago in 1933-1934 and followed by major expositions at San Diego, Calif.; Dallas, Texas; San Francisco; and Cleveland. At about this same time, the museum idea was being promoted in Germany, through the Dresden Health Museum.

Despite the outbreak of World War II, the New York World's Fair plans for 1939 and 1940 were carried through and included an ambitious and impressive Hall of Man, which was in effect a health museum established on a temporary basis for the duration of the fair. It was expected that out of this Hall of Man would grow an American Museum of Health. These plans failed to materialize, but other plans did.

In Cleveland, the Academy of Medicine led a movement to establish a Cleveland Health Museum, incorporated December 7, 1936, and opened to the public on November 13, 1940. This was the first actual health museum in America, although there had been health exhibits in connection with other museums at Rochester, Minn.; Buffalo; and Toledo, Ohio and, as early as 1916, in the American Museum of Natural History in New York. The use of exhibits for carrying the health message to the public at county fairs and such occasions was also fairly well established in the United States. Several medical societies had held such exhibits and so had departments of health, as well as the voluntary health agencies.

In 1940, the House of Delegates of the American Medical Association passed a resolution approving the American Museum of Health and expressing the hope that other health museums would be established as a result of this pioneer action.[1] The Cleveland Health Museum became, *in fact*, the actual pioneer. The health museum at Dallas was incorporated and opened to the public on October 5, 1946.

A new idea was introduced into the health museum concept by the Lankenau Hospital of Philadelphia, which opened to the public on December 7, 1953, a wing of the hospital itself, conceived as a part of the original plan and dedicated and endowed as an educational device for the enlightenment of patients and visitors. This was the first inclusion of a health museum on a permanent basis in a hospital, although previous efforts had been made to utilize hospital waiting rooms for educational purposes by the use of exhibits, and the American Public Health Association had for some years a committee on the use of health exhibits in hospitals. On November 2, 1957, the Smithsonian Institution opened a new hall of health.

The latest addition to the ranks of health museums and the newest idea in connection with such institutions will be the Hinsdale Health Museum at Hinsdale, Ill., to be opened in May, 1958. This will be the first health museum in the world to be built in conjunction with a professional office building housing physicians, dentists, and allied professional persons.

Each of these steps has been logical, bringing the health message to the place where people are instead of expecting them to go where it is to be found. All of these health museums came into being on a local level to fill a local need. Their influence has extended beyond their borders, and they have all become statewide and nationwide assets.

The growth of specialized health museums has stimulated museums of science and even museums of natural history to establish "galleries of health," as at the Nebraska State Museum (1954), or halls of public health, as at the Boston Science Museum (1956). Many of these museums took the medical exhibits of the *Museum of Science* and Industry in Chicago, established in 1935, as their prototype.

The A. M. A. through its Bureau of Exhibits has furnished materials to a number of health museums, including those in Cleveland and Dallas and the [illegible] *eviously.* Museum of Science and Indus[illegible] *for longer than* traveling health e[illegible]its, *follo*[illegible] lished by the [illegible] county fairs [illegible] ls. By extension, these exhibits have appeared elevision in connection with many such meet- i.

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[1] Cleveland Museum of Health, editorial, J. A. M. A. 115:1457- [illegible] 28) 1940.

ne modern concept of a health museum is ex- sed by Dr. Bruno Gebhard, director of the veland Museum and pioneer in the health mu- n field, in the striking phrase, "A museum, not ausoleum." On this principle, it has now become t of accepted health museum technique to use diums other than the fixed exhibit, such as veling exhibits, motion pictures, films, radio pro- ums, lectures, newspaper stories and features, and deed every technique in health education. The dern health museum is a center for health edu- ion and promises to be one of the most potent ces available for this purpose.

The medical profession welcomes the Hinsdale Iuseum to the growing ranks of American health useums and looks to a future in which other com- unities will follow suit with projects best suited their individual local needs.

AERO MEDICINE

The rapid progress in rocketry and the possibility flight into far distant space have brought forth any new problems of a medical nature and pened up a still wider field for research. The chal- nge thus imposed has already been accepted, as vas shown in March at the 29th annual meeting of the Aero Medical Association. On the three-day program were reports of studies on human behavior in flight, protection at extreme altitude, aviation physiology, aviation psychology, accidents and flight safety, hypothermic stress, sensory problems, acceleration, deceleration, and space medicine. Leading space investigators believe that the medical challenge of space flights can be met and that the difficulties involved in flights to the moon and some of the nearer planets will eventually be overcome.

The problems associated with sustaining life in a space-like environment include consideration of protection from the effects of cosmic radiation, unfiltered solar ultraviolet and x-ray radiation, meteorite collision, and the breathing, cooling, and heating requirements. Certain statements from various presentations at this meeting are of general interest to physicians.

The concept of the composition of the true extra-atmospheric cosmic ray beam has considerably changed recently. Next to the atmosphere, the most powerful shielding force preventing low-energy cosmic ray particles from reaching the earth is the geomagnetic field. The magnetic field of the earth strongly influences the influx of corpuscular rays of solar and cosmic origin by channeling them into the polar regions. The density of distribution of these ray particles in adjacent space, in fact, shows considerable variations with the earth's latitudes. At present no informed guess seems possible with regard to the ionization dosage in interplanetary space.

It is known that aircraft collision with birds can occur up to 20,000 ft. and that bird-windshield collision can impose a serious hazard to the pilot personally and as an aircraft operator.

Analysis of the accidents experienced in a number of the latest high-performance aircraft indicated that, although the margin for error has decreased, Air Force pilots can successfully operate this high-performance equipment. Material failure was the predominant accident cause. The greatest operator difficulty was experienced during the landing process. This analysis indicated that engineering and materiel, rather than crew limitations, may be the critical factors in future flight.

A study was reported of 144 aircrew members in B-52, F-100, and T-33 types of aircraft with regard to the effect of flight on their blood sugar levels. Glucose tolerance tests were performed on these crews and the results evaluated as to the change in blood sugar level as well as the absolute basic level. Glucose tolerance tests revealed an incidence of about 10% "flat" curves, which was thought to be consistent with the emotional stress encountered.

A medical officer participated in an 11,000-mile nonstop flight of six B-52 aircraft. Samples of urine collected from four crew members during the flight were evaluated for the 17-hydroxycorticosteroids. The subjects showed a mean average during the flight of 15.2 mg. compared with 8.9 mg. per 100 cc. the control day over 24 hours. There was, as has been shown in other studies, an increase in adrenal cortical activity in subjects emotionally disturbed and in stressful situations. Quantitatively, the 17-hydroxycorticosteroids in the urinary output of flying personnel was believed to be a favorable index for evaluating stress.

In the session on space medicine, there were discussions on the techniques now available for the reconstitution of human urine in the form of potable water and on a closed food cycle atomic conservation for space flight. One of the most difficult medical problems in space medicine was said to be the development of closed food and air systems. It was said that physical and chemical recycling methods could be used "for short hops" but that for longer voyages a photosynthetic system, such as one producing oxygen through the use of algae, would be required. Another speaker said that urine would be the main source of water and that for recycling this product electro-osmosis appeared to be the most practical possibility at present. An experimental space diet was said to be in preparation for a clinical trial.

Radio transmission and electrical recording have made it possible to monitor the physiological condition of crew men during stratosphere flights. Data obtained in two balloon ascents and in several stratosphere flights in high-performance aircraft indicated that in some subjects the pulse rate became as high as 165 and 180 per min respiratory rate as high as 60 per m their blood and urine constituents generally were found to be within normal limits, with little if any indication of the effects of stress.

Realizing that a considerable part of the research necessary to the solution of these problems will be conducted by investigators other than doctors of medicine, the Aero Medical Association voted to amend its constitution and by-laws so that physiologists, psychologists, anthropologists, and some other scientists would be eligible to become full-fledged members of the association.

At the business meeting the association voted to strongly recommend that an adequate medical department be established in the Civil Aeronautics Administration directly responsible to the CAA administrator and that Congress be petitioned to enact legislation to accomplish this purpose.

THE RECALCITRANT TUBERCULOUS PATIENT

With few exceptions, patients having tuberculosis present no social problem to the private physician or to the local health department. There is, however, the occasional patient who will not assist in caring for himself and who, in addition, has no concern for the welfare of others. This individual goes his way spreading tubercle bacilli in his home, his neighbor's home, and in public places. Unfortunately, it seems this type of individual is also often afflicted with alcoholism, and the two diseases produce a danger that is proportionately far greater to the community than just the sum of both conditions.

What can the practicing physician do about such a patient, besides worry? Actually very little beyond trying to persuade him to "see the light" and have some concern for his own welfare and that of others. But when that attempt has failed, the physician's only recourse is to work with the local health officer, who is vested with strong legal powrs where communicable diseases are involved.

What can a health officer do? First, he too will try persuasion, usually directly and through his nursing staff. Sometimes the health officer will succeed where the private doctor has failed because the patient is angry at the doctor who told him he has tuberculosis and is purposely resisting that doctor's recommendations. This may seem like an unusual situation, but it occurs with too much regularity to be discounted. More often, however, the recalcitrant patient with tuberculosis retains his unreasonable attitude. In these circumstances the health officer next discusses the legal measures at his command. Mere impartment of such knowledge to most stubborn patients will be the convincing factor that causes the sick man to follow faithfully the recommended therapeutic regime.

In a small percentage of instances, though, neither the private physician nor the health department is able to communicate with an obstinate patient. In such cases it is then necessary to resort to available legal measures. While official procedures may differ from state to state, the principle behind enforced isolation of the patient with a dangerously communicable disease is fairly consistent—to prevent, where possible, the spread of infection.

To be sure, advances in drug therapy have altered many ideas as to which illnesses should be isolated. But there still remain several diseases (e. g., smallpox, cholera) whose infectivity demands the patient's immediate separation from a susceptible population. Isolation, of course, need not always be limited to a hospital or institution, and in the majority of such cases removal from contact with susceptible persons can be quite adequately carried out at home.

Where the tuberculous patient has no visible means of taking care of himself at home, it is not uncommon to place him in some preselected location that can provide not only isolation but, of greater importance, treatment. Many health departments have routine arrangements, and the use of legal powers is not actually invoked unless and until the patient violates his "friendly" isolation order. At this point, when all else has failed, it becomes necessary to isolate the patient under lock and key. But there is always the cry that a jail is no place for a sick person. Fortunately, many states have therapeutic lock and key facilities, called correctional institutions, where treatment and guidance are administered simultaneously, with the ultimate hope that the patient can be cured mentally as well as physically.

It is interesting to note a recent opinion of the California Attorney General concerning recalcitrancy and isolation. A recalcitrant patient with tuberculosis was defined as "one who by his present or past statements and conduct has demonstrated that he will not obey the current quarantine and isolation order." In supporting his belief that the patient's tuberculosis is contagious, the health officer was advised to include two certificates of physicians who specialize in tuberculosis, showing that the patient has active, contagious tuberculosis and is still a public health menace. Isolation of any person with a disease, even in a local jail, is permissible if such action becomes necessary to employ reasonable security measures.

Enforced isolation of a person with any disease is an extremely controversial procedure. Interestingly enough, many health officials do not require, but only desire, the isolation of a patient with tuberculosis. There is a growing feeling that, with proper medical supervision, the tuberculous patient is more apt to cooperate in the confines of his accustomed environment. Education of the public to better understand the present-day treatment of this disease, plus a community awareness of all the methods available to care for those who resist proper medical care, will serve as the best deterrents to potentially recalcitrant patients.

ORGANIZATION SECTION

A. M. A. SESSION ON LEGISLATION

How do representative doctors feel about specific governmental activities in hospital construction, medical school aid, and the medical aspects of air travel operations, social security, veterans' affairs, vocational rehabilitation, and workmen's compensation? What is the "climate" in Washington, D. C., today—what will it be tomorrow—in regard to legislative matters relating to federal involvement or noninvolvement in the health of individual Americans? And what about the individual physician—where does he fit into the Washington scene?

For six straight hours (even a sandwich luncheon did not intrude on its flow of work) the American Medical Association's only group concerned exclusively with a study of federal agencies and lawmaking tackled these questions late in March. The group is the eight-year-old Committee on Legislation, whose 11 members come from every region of the nation. It is sometimes described as the most sensitive committee of the A. M. A.—most sensitive to the same "typical U. S. doctor" opinion which ultimately lies behind every action of the policy-making A. M. A. House of Delegates. But while sensitiveness may be there, final decision is not. Each committee recommendation is subject to action of the Board of Trustees.

Committee discussions in Washington on March 29 dealt largely with "on the scene" reports from the A. M. A. Washington office, which monitors the many legislative and administrative activities in the capital as they relate to health. The committee also listened to progress reports of a staff group which has been informing both medical and nonmedical leaders across the nation of the risk and expense of proposed free hospitalization and nursing home care for the aged under social security. The staff group told committee members it has been able to show these leaders that expanded health insurance coverage and other free-enterprise mechanisms offer a better solution to the problem of improved health care for the aged. One of these positive mechanisms has been established voluntarily within the health professions. It is the Joint Council to Improve Health Care for the Aged, comprised of representatives of the A. M. A., the American Dental Association, the American Hospital Association, and the American Nursing Home Association.

Chairman of the Committee on Legislation is Dr. George M. Fister of Ogden, Utah, who is also a member of the A. M. A. Board of Trustees. Other committee members are Drs. McKinnie L. Phelps of Denver; C. Byron Blaisdell of Asbury Park, N. J.; R. B. Chrisman Jr. of Coral Gables, Fla.; Frank C. Coleman of Des Moines; Harlan English of Danville, Ill.; Frank J. Holroyd of Princeton, W. Va.; J. Lafe Ludwig of Los Angeles; John E. McDonald of Tulsa; D. Olan Meeker of Riverside, Conn.; and George E. Twente of Jackson, Miss. Committee secretary is Mr. Warren Whyte of the A. M. A. headquarters staff.

REPORT OF JOINT COMMISSION ON *ACCREDITATION OF HOSPITALS*

The following items from the March, 1958, issue of the bulletin of the Joint Commission on Accreditation of Hospitals (660 N. Rush St., Chicago; Kenneth B. Babcock, M.D., director) are reproduced here for the information they contain that will be of interest to many physicians.—Ed.

Hospital Consent Forms

The question of medical professional liability was discussed at the Board of Commissioners' meeting and it was decided that hospitals should be advised that many consent forms presently in use are inadequate and should be re-evaluated. The commissioners did not and will not endorse any specific form. They recommended that the hospital obtain local legal counsel in its preparation. In principle the form should be an informed consent which means that the signer knows what he is signing, knows what is to be done, and understands the risk involved to the patient. It should include such information as the following: name of the hospital in which the operation or procedure is to be performed, and date consent is signed; name of the patient on whom the operation or procedure is to be performed; statement of the nature of the operation or procedure to be performed; authorization for administration of anesthesia, if necessary; authorization to perform such additional operations or procedures as are considered necessary or desirable in the judgment of the surgeon or physician; consent to dispose of tissues or parts removed at operation; statement that the signer is aware of the contents of the form he is signing; signature of patient or person legally authorized to give consent on patient's behalf; and signature of witness.

Progress Report—1957

During the five years the Joint Commission on Accreditation of Hospitals has been functioning, there has been a steady gain in the number of accredited hospitals. This is shown in table 1. The 1952 figures indicate the number of hospitals accredited by the American College of Surgeons when the Commission came into existence.

During the five-year period 1953-1957, the total number of hospitals which took part in the accreditation program was 4,521. Of this number 3,857 (85.4%) are accredited and 664 (14.6%) are not accredited. It is encouraging to note that the hospitals not accredited are working diligently to achieve accreditation and many have requested resurvey. Experience has shown that progress toward accreditation is accelerated after a survey and improvement in patient care has resulted. Even though a hospital does not achieve accreditation on the first visit, a survey is of considerable value. Table 2 shows the number of surveys that have been done by the Commission.

Of the total number of surveys done, 6,390 (89.3%) resulted in accreditation and 765 (10.7%) *in no accreditation. The proportion of those resulting in no accreditation has dropped from 11%* in 1953 to 8.2% in 1957. The Commission finds this trend encouraging. It supports the theory that a large number of hospitals which have been surveyed and not accredited have the potential to become accredited. It is estimated that there are 7,000 hospitals in the United States and Canada eligible for accreditation. Of this number 55.1% are accredited. This indicates that we all have a long pull ahead.

TABLE 1.—*Number of Hospitals Accredited*

	1952	1953	1954	1955	1956	1957
Total	3,265	3,395	3,513	3,630	3,770	3,857
U. S. and possessions	3,085	3,111	3,219	3,319	3,441	3,525
Canada	269	275	285	302	318	321
Foreign	8	9	9	9	11	11

TABLE 2.—*Number of Surveys Conducted*

	Total	1953	1954	1955	1956	1957
Total	7,155	1,306	1,385	1,378	1,421	1,665
U. S. and possessions	6,494	1,213	1,233	1,234	1,299	1,515
Canada	649	92	151	136	120	150
Foreign	12	1	1	8	2	

A. M. A. SUPPORTS BILL FOR AIR SURGEON, RESEARCH LABORATORY IN CAA

"Increasing air traffic and the jet age, accompanied by increased physical demand on pilots, require a substantial revision in the present method of handling many aspects of aviation medicine."

Thus does Dr. F. J. L. Blasingame, General Manager of the American Medical Association, sum up official A. M. A. support for pending legislation to strengthen the medical department of the Civil Aeronautics Administration. (His letter to U. S. Senator Warren G. Magnuson, whose Committee on Interstate and Foreign Commerce has been considering such a bill, appeared in the Organization Section of the April 26th issue of THE JOURNAL, pages 2189-2190.)

Also supporting the Senate bill is the Aero Medical Association, which late in March adopted a resolution identical to one voted last December by the A. M. A. House of Delegates. This resolution, in calling for "a completely adequate and competent medical department in the CAA," noted that "the safety of the flying American public (28 million passengers in 1957) is dependent upon the health, fitness to fly, and productive efficiency of pilots and air control personnel."

Urged by Committee

In asking passage of the legislation (Senate Bill 1045) the A. M. A. drew upon recommendations of its new Committee on Aviation Medicine, headed by Dr. Jan H. Tillisch of Rochester, Minn. That committee, meeting in Washington, D. C., on March 27, pointed out that the Civil Aeronautics Board, which now has rule-making authority for medical standards, does not have a single qualified person in the medical field. The proposed bill would transfer this authority to the CAA, which now has some medical specialists who could function more effectively under a Civil Air Surgeon.

Under present regulations a conflict of authority exists wherein the CAB has the right to review and overrule CAA disqualifications or denials of pilot certification. Not long ago, for example, the CAA refused to grant certification to three applicants because medical investigation showed they had histories of mental illness. Yet, early last month the CAB rejected this medical opinion, and later it was revealed that one of the applicants had since died—in effect, had won the right to fly after his death.

Civil Aeronautics Administrator James T. Pyle has praised the A. M. A. Committee (of the Council on Industrial Health) for its help in attempting to solve CAA medical problems. The office proposed in his agency would set minimum standards of mental and physical fitness for civil airmen, make regulations for safety inspection of aircraft, investigate possible medical causes of aircraft accidents, and conduct medical research leading toward safer civilian air travel.

Hazard to Safety

In discussing the need for Senate Bill 1045, the A. M. A. Committee reported: "Airmen are permitted to fly today under circumstances which create a distinct hazard to the safety of the flying public. If we do not correct these conditions through major changes, we are defaulting to the American public. If the proposed bill is what it takes to establish a medical organization which could be effective, then we ought to support this legislation. We should not sit back on generalizations of medical practice but very specifically point out what we need."

The A. M. A. Committee on Aviation Medicine heard testimony that persons suffering from coronary and other cardiac conditions, epilepsy, diabetes, psychoneurosis, and psychosis have been granted permission to pilot aircraft after appealing to the CAB—and that medical certification has been denied to less than 1% of applicants, whereas 25% of a comparable group in the general population would not have met the same physical standards. The Committee is studying proposals which would demand even closer medical surveillance of air crews assigned to passenger-carrying jet and rocket-powered aircraft—to assure proper human functioning in such special environmental conditions as extreme high altitude, greater speed of flight, and fuel limitations which may require irreversible decisions for landings.

There are approximately 827,000 civilian airmen in the U. S., of whom 13,341 are certified to carry passengers on a regular basis.

CIVIL DEFENSE MEETINGS PRECEDING SAN FRANCISCO SESSION

Two medical civil defense meetings will be held in San Francisco preceding the 107th Annual Meeting of the A. M. A. On June 19-20, the 12th Naval District will sponsor a symposium on "Medical Problems of Modern Warfare and Civil Defense" at the Naval Radiological Defense Laboratory, and on June 21 the A. M. A. Council on National Defense will sponsor its Annual National Medical Civil Defense Conference in the Sheraton-Palace Hotel. Dr. David B. Allman, A. M. A. President, and Frank W. Barton, Secretary, A. M. A. Council on National Defense, will speak at the naval symposium on the plan and activities of organized medicine for medical preparedness in disasters or in the event of all-out war.

Dr. Gunnar Gundersen, A. M. A. President-elect, will welcome participants to the A. M. A. civil defense meeting on June 21. The current federal civil defense program, including the national plan for mobilization of resources will be outlined during the morning session by officials of federal government agencies. Also at the morning session will be a discussion of the threat and impact of newer weapons and delivery systems, and a report on the legislative program now pending before Congress for a national survival plan by the Hon. Chet Holifield, U. S. congressman, 19th district of California.

During the afternoon, the surgeons-general of the Army, Navy, Air Force, and Public Health Service will discuss the civil defense role and responsibilities of civilian physicians; other subjects include the radioactive fall-out problem and the feasibility of a national shelter program. All physicians interested in civil defense planning are urged to attend both meetings.

MEETING ON LABELING OF CHEMICALS

The A. M. A. Committee on Toxicology has drafted a model law requiring precautionary labeling of hazardous substances in commercial, household, and industrial chemicals. The bill is intended as a model for uniform laws to require the declaration of hazardous ingredients and warning statements on the label and in the accompanying literature of chemical products.

The first of two or more conferences with representatives of health departments, regulatory agencies, medical societies, and allied health organizations to discuss this and other tentative legislation will be held May 9 at A. M. A. headquarters, Chicago. The Conference on Labeling Hazardous Substances will focus attention on the nature of the problem as seen by the public, the medical profession, regulatory officials, and trade associations, and will provide discussion on both local and federal labeling laws.

COUNCIL ON MEDICAL SERVICE

NEW STUDY IN MICHIGAN—HEALTH FACILITIES AND INSURANCE

A comprehensive two-year study of Michigan's hospital and medical economics, under the direction of the University of Michigan, began in March, according to a recent announcement.

The study was requested by the Governor's Commission on Prepaid and Medical Care Programs and will be financed by a $325,760 grant from the Kellogg Foundation.

The study will include the following:

1. A survey of hospitals, allied institutions, and agents in terms of services offered, general program, effectiveness of organization, and cost elements will be conducted to determine what health facilities and programs exist in Michigan which might logically fall within the realm of health insurance and prepayment, either on a service or indemnity basis.
2. Hospital and medical prepayment and insurance plans will be examined with specific reference to internal operation, costs, benefits, and contract limitations.

3. The relationships between contract benefits, availability of services, and use of benefits and services by patients will be studied.
4. The effectiveness of various proposals to control hospital and medical costs will be examined.
5. Hospital efficiency in terms of use of available facilities, timing of services, accounting, automation and substitute skills, medical staff organization, and regional planning will be investigated.
6. The problem of additional charges by physicians in respect to service contracts and the relationship, if any, between physician expenses to the patient and the extent of insurance coverage will be explored through interviews with patients and physicians.
7. A sample of the population with emphasis on the aged, retired, and disabled will be surveyed to determine its health experience, charges incurred, amount of insurance coverage, and current disability.
8. A study of Michigan Hospital Service and Michigan Medical Service (Blue Cross-Blue Shield) will be made specifically because of their size and breadth of program. This study will cover such factors as administration, accounting, benefits, enrollment and underwriting policies, rating principles, hospital relations, research and planning, reserves, service concept, and use of services. In Michigan Medical Service only, fee schedules and the characteristics of participating and nonparticipating physicians will also be analyzed.

The following associations have pledged their cooperation to the university in the study: the Michigan State Medical Society, Michigan Hospital Association, Michigan Association of Osteopathic Physicians and Surgeons, Michigan Osteopathic Hospital Association, Michigan Chiropodists Association, Michigan Hospital Service, and Michigan Medical Service (Blue Cross-Blue Shield).

Director of the Study will be Walter J. McNerney, head of the Bureau of Hospital Administration in the university school of business administration.

Dean Russell A. Stevenson of the School of Business Administration will be chairman of the University's Policy Committee for the project. Members will include Marvin L. Niehaus, vice-president and dean of faculties; Albert C. Furstenberg, M.D., dean of the Medical School; Henry F. Vaughan, dean of the School of Public Health; Albert C. Kerlikowske, M.D., director of the University Hospital; Rensis Likert, director of the Institute for Social Research, and McNerney.

The total report is expected to be available two years after the start of the study in March. Interim reports will possibly be made at the end of 9, 12 and 15 month periods. The university will report its findings and "constructive interpretations" to the public.

MEDICARE INDEMNITY PLAN CONFERENCE

Ways and means to secure an indemnity type Medicare plan for those states preferring it were explored by representatives of 11 state medical associations at a Medicare Indemnity Plan Conference in Atlanta, Ga., Jan. 10-11.

The meeting was called by the Medical Association of Georgia, which had previously conducted a survey of state associations to ascertain, among other things, the changes each would like in its program for providing medical service to eligible dependents of active duty armed forces personnel.

In a "conference recommendation" adopted at the meeting, it was stated that the representatives present "take exception to the imposition of a service-type program because of their convictions that under P. L. 569 an indemnity-type plan is permissible. Further, they express their sincere belief that an imposed service-type program interferes in principle and in practice with the doctor-patient relationship and contributes to deterioration of good medical practice.

"They consider it imperative for these and other state associations jointly to petition the appropriate congressional committees and the Secretary of Defense to permit negotiation of an indemnity program at the time of renewal of Medicare contracts.

"They therefore agree to request their associations to petition the appropriate congressional committees and the Secretary of Defense in this regard, in a concerted action, at the earliest moment permitted by approval of the associations concerned."

The state associations represented at the conference were Alabama, Arizona, Florida, Georgia, Kentucky, Ohio, Pennsylvania, Rhode Island, Tennessee, Texas, and Virginia. Dr. Chris J. McLoughlin, secretary-treasurer of the Medical Association of Georgia, served as conference chairman. In addition to the state representatives, Dr. Hugh H. Hussey, member of the A. M. A. Task Force on Dependent Medical Care, and Mr. George W. Cooley, secretary of the A. M. A. Council on Medical Service, attended the meeting.

The conference recommendation was to be submitted by the representatives of the 11 states to the appropriate bodies of their own associations. These representatives agreed that if unity of action could be obtained, the states approving the recommendation could act jointly in presenting requests to the Secretary of Defense and appropriate Congressional committees for the purpose of effecting progress in having the Department of Defense consider indemnity type Medicare plans for states desiring to negotiate that type of contract.

The conference further recommended that information on the conference action be circulated among other state medical associations so that they, too, might give consideration to it.

MEDICAL NEWS

CALIFORNIA

Clifford Sweet Annual Seminar.—The seventh annual Clifford D. Sweet Seminar, sponsored by Children's Hospital of the East Bay, Oakland, will be held on May 16-17 at the Claremont Hotel in Berkeley. The guest speakers will be Dr. James G. Hughes, chairman, department of pediatrics, University of Tennessee College of Medicine, Memphis, and Dr. Paul H. Holinger, professor of bronchoesophagology, University of Illinois and Children's Memorial Hospital, Chicago.

COLORADO

Children's Hospital Summer Clinics.—The 10th annual Summer Clinics of The Children's Hospital in Denver will be held June 18-20. Designed for all physicians concerned with the care of infants and children, the clinics will present recent advances appropriate to practice, will emphasize early recognition of disease, common problems in the management of children's diseases, and will outline successful programs of therapy. Guest faculty this year will be Dr. Lee Forrest Hill, chief of staff, Raymond Blank Memorial Hospital, Des Moines; Dr. Meyer A. Perlstein, professor of pediatrics, Cook County Hospital, Chicago; and Dr. William B. Kiesewetter, associate professor of surgery, University of Pittsburgh School of Medicine. Information can be secured by writing the Chairman, Summer Clinics Committee, Children's Hospital, Denver 18.

ILLINOIS

Hospital News.—The eighth lecture in the eighth annual North Shore Hospital Lecture Series on "The Emotional Problems of Childhood" will be held May 7, 8:00 p. m. "Management of the Neuroses of Adolescence" will be discussed by Dr. Eugene I. Falstein, clinical professor of psychiatry, Chicago Medical School. The Commission on Education of the American Academy of General Practice has approved these lectures for category II credit. Physicians and allied professional personnel are invited.

Chicago

Professor Coulter Dies.—Merle C. Coulter, Ph.D., professor of botany and associate dean of the division of the biological sciences, University of Chicago, died March 17 in Billings Hospital. Dr. Coulter was appointed instructor in botany at Chicago in 1921, and he became professor in 1931. His research was in plant genetics. When the general education program of the college of the University of Chicago was being developed he was chairman and principal organizer of the general courses in the biological sciences. He served as dean of the college in 1930 and 1931 and as adviser to premedical students from 1925 to 1948, when he was appointed associate dean of the division of the biological sciences in charge of nonclinical departments. In 1945 he taught at the Army's University Study Center, at Shrievenham, England. He also served on the Committee of Ten, of the Association of American Medical Colleges, which conducted a three-year survey of preprofessional training of medical students in the United States.

Hospital Planning Council Formed.—Formation of the Hospital Planning Council for Metropolitan Chicago has been announced by Mr. Edward L. Ryerson, president of the council. Problems as to what new facilities will best meet the hospital requirements of communities, where new facilities should be located, what type improvements should be made, how duplication of expensive resources can be minimized, and how old hospitals can be adapted for future use will be studied and recommendations made to all area hospitals and medical agencies. Objectives of the new council are (1) to plan the development of hospitals and other facilities for the care of the sick in accordance with measured needs; (2) to coordinate the services of the hospitals, the public health and welfare agencies and to bring about a closer interrelation of hospitals with other facilities for the care of the sick; (3) to study, develop, and make recommendations concerning standards and methods to improve the services and financial economy of hospitals and related facilities; (4) to provide a means whereby the interests of the hospitals and the medical professions may be more closely correlated; (5) to advise the public and the cooperative fund-raising agencies, concerning the financial needs of hospitals and related facilities; and (6) to interpret to the citizens of the community the services available for the care of the sick.

INDIANA

Annual Pathology Seminar.—The Indiana Association of Pathologists, together with the U. S. Veterans Administration Hospital, the Indiana Cancer Society,

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

and Indiana University School of Medicine, is sponsoring its 10th annual seminar May 25 at the VA Hospital in Indianapolis. The subject will be "Diseases of the Uterus (Including Cytologic Aspects)," presented by Dr. James W. Reagan, professor of pathology, Western Reserve University, Cleveland. A number of slide sets and protocols will be available for pathologists who are not members of the state association but who wish to atend. These sets will be issued to those who apply, in the order of their applications, as long as they last. A fee of $5 will be charged, and this should be sent together with the request for the set to Dr. Lester H. Hoyt, Secretary, I. A. P., Methodist Hospital, Indianapolis 7. It will not be necessary to bring microscopes or slides to the meeting. Members of the medical profession are cordially invited.

KANSAS

State Medical Meeting in Kansas City.—The 99th annual session of the Kansas Medical Society will be held May 4-7 at the Kansas National Guard Armory, Kansas City. Dr. William F. Roth Jr., president, Wyandotte County Medical Society, will present an address May 5. Guest speakers include Drs. John J. Bonica, Tacoma, Wash.; Francis W. Carruthers, Little Rock, Ark.; George Crile Jr., Cleveland; Benjamin Felson, Cincinnati; Arthur Grollman, Dallas, Texas; Abe Matheson and Walter J. Reich, Chicago; William H. Re Mine Jr., Rochester, Minn.; Alfred R. Sugg, Ada, Okla.; and Bruce K. Wiseman, Columbus, Ohio. Two panel discussions, "Advances in Management of Disorders of the Stomach and Duodenum" and "Medicolegal Problems," will be moderated by Drs. Arthur P. Klotz, Kansas City, and Thomas P. Butcher, Emporia, respectively. Luncheon question-and-answer sessions, hospital tours, exhibits, and specialty meetings the afternoon of May 5 are planned. Speaker at the annual banquet of the Kansas Chapter, American Academy of General Practice (May 5) will be columnist Drew Pearson, Washington, D. C. For information write Mr. Oliver E. Ebel, 315 W. Fourth St., Topeka, Kan.

MARYLAND

General Practice Meeting in Baltimore.—The 1958 spring scientific assembly of the Maryland Academy of General Practice will be held at the University of Maryland School of Medicine, Baltimore, May 8. The program includes the following members of the university faculty:

Convulsive Disorders: Detection and Management, Dr. Charles Van Buskirk, head, division of neurology.

Pharmacologic Horizons—An Avalanche of New Drugs, John C. Krantz Jr., Ph.D., head, department of pharmacology.

Industrial Medicine, Dr. Charles R. Edwards, professor of Office Gynecology, Dr. Ernest I. Cornbrooks Jr., associat professor of obstetrics and gynecology.

Plastic Surgery Principles in Office Surgery, Dr. Clarence P Scarborough Jr., assistant professor of surgery (plastic)

A special luncheon ($2.50) program is arranged For information write the Maryland Academy o General Practice, 3722 Greenmount Ave., Baltimore 18.

MICHIGAN

Eye Screening of Children.—Michigan's first mas eye screening program for preschool children wa recently conducted by the Macomb County Healt Department at the Seminole School in Mt. Clemens the Michigan Department of Health has announced The Mt. Clemens pilot project was an extension o vision screening programs conducted routinely i Mt. Clemens schools and in the schools of mos other state communities. Children in the Mt. Clemens program were 3 and 4 years old. The screening was done by a technician of the Macom County Health Department. Parents of preschoolers unable to pass the screening are being advised. O 383 eligible children, 321 took part in the program. The second preschool vision screening program in Michigan was conducted in Grand Traverse County April 21-25 and, reportedly, similar programs will be held in other areas of the state.

NEW HAMPSHIRE

Informal Conferences on Research.—The Gordon Research Conferences for 1958 will be held from June 9 to Aug. 29 at Colby Junior College, New London, New Hampton School, New Hampton, and Kimball Union Academy, Meriden. The conferences were established "to stimulate research in universities, research foundations and industrial laboratories." This purpose, achieved by an informal type of meeting consisting of scheduled and free discussion groups, is primarily to bring experts up to date as to the latest developments, analyze the significance of these developments, and to provoke suggestions as to underlying theories and methods of approach for making new progress. The three conferences will have as their themes "Cancer," "Toxicology and Safety Evaluations," and "Vitamins and Metabolism." Persons interested in attending are requested to send applications to W. George Parks, Ph.D., Director, Department of Chemistry, University of Rhode Island, Kingston, R. I. Each applicant must state the institution or company with which he is connected and the type of work in which he is most interested. Attendance at each conference is limited to 100. Information presented is not to be used without specific authorization of the individual making the contribution, whether in formal presentation or in discussion. No publications are prepared as emanating from the conferences.

NEW YORK

Annual State Medical Meeting.—The 152nd annual meeting of the Medical Society of the State of New York will be held May 12-16 at the Hotel Statler, New York City. The general sessions will be presented as a group of symposiums and panel discussions under the following headings and moderators:

Advances in Special Fields of Surgery: Part I, Dr. John M. Chamberlain, New York City; Part II, Dr. E. Jefferson Browder, Brooklyn; Part III, Dr. Frank Glenn, New York City.
Functional Disorders of the Esophagus, Dr. Abraham H. Aaron, Buffalo.
Advances in Antimicrobial Therapy: Part I, Dr. Perrin H. Long, Brooklyn; Part II, Dr. Carl Muschenheim, New York City.
Medical and Surgical Complications of Pregnancy, Dr. Morris Glass, Brooklyn.
Secreting Tumors: Clinical Recognition and Management, Dr. Martin Perlmutter, Brooklyn.
Coma and Unconsciousness, Dr. Linn J. Boyd, New York City.
Rehabilitative Measures in Clinical Practice, Dr. Donald A. Covalt, New York City.
Present Concepts of Carcinogenesis, Dr. Cornelius P. Rhoads, New York City.

The A. Walter Suiter Lecture, "Medical Aspects of Functional Disorders of the Esophagus," will be presented by Dr. Charles A. Flood, New York City. Sessions on legal medicine and the history of medicine, with a symposium on "A History of Tuberculosis," are scheduled. Scientific and industrial exhibits and motion pictures will be shown. A dinner dance will be held May 14, 7 p. m. For information write the Medical Society of the State of New York, 386 Fourth Ave., New York 16.

Institute on Workmen's Compensation.—A two-day institute on the purposes and administration of workmen's compensation will be conducted at the Hotel Syracuse in Syracuse May 7-8 to provide a discussion of the philosophy and intent of Workmen's compensation by specialists in the field for the benefit of those who work with the Workmen's Compensation Law in the nine counties served by the Syracuse District Office. Other institutes will be held in May and June at district offices at Rochester, Buffalo, and Binghamton, and in October at New York City. The nine counties in the area of the Syracuse District Office include: Cayuga, Onondaga, Madison, Herkimer, Oneida, Oswego, Lewis, Jefferson, and St. Lawrence.

New York City

English Doctors Serve as Visiting Professors.—Three doctors from England were appointed visiting professors at the State University of New York Downstate Medical Center in Brooklyn this spring. Dr. Leslie John Witts, Nuffield professor of medicine at Oxford University, was visiting professor of medicine during March. In the department of environmental medicine and community health, Dr. Thomas McKeown, professor of social medicine at the University of Birmingham England will be visiting professor for one month beginning April 23. Dr. McKeown is senior editor of the *British Journal of Preventive and Social Medicine.* Dr. Arnold A. Miles, director, Lister Institute of Preventive Medicine and professor of experimental pathology at the University of London, will be visiting professor of microbiology and immunology from April 15 to July 15. Dr. Miles is co-editor of *Principles of Bacteriology and Immunology.* Prior to his present position he was deputy director of the National Institute for Medical Research in London.

Dr. Martí-Ibáñez Honored.—Three awards from history of medicine societies have been bestowed on Dr. Felix Martí-Ibáñez, director, department of the history of medicine, New York Medical College, Flower and Fifth Avenue Hospitals, and editor-in-chief of the medical newsmagazine, *MD.* At the annual congress of the Turkish Society for the History of Medicine in Istanbul, Dr. Martí-Ibáñez was made an honorary member in recognition of his "service and dedication to the History of Medicine throughout the world, sympathy and understanding of the Turkish History of Medicine, and for the originality of his contributions to Medicine and culture." Dr. Martí-Ibáñez was also appointed honorary member of the Society of the History of Medicine in Brazil, of which he was corresponding member. He will be awarded a diploma at the next meeting of the society, to be held in Rio de Janeiro. The Cuban Society of the History of Medicine also nominated Dr. Martí-Ibáñez as a member of honor at their last meeting.

Symposium on Basal Ganglia Surgery.—The New York University-Bellevue Medical Center and St. Barnabas Hospital will present a three-day symposium on "Basal Ganglia Surgery For Involuntary Movement Disorders," sponsored by the American Rehabilitation Foundation and the Sister Elizabeth Kenny Foundation, May 15-17 in the Alumni Hall Auditorium. Panel speakers include Dr. T. Reichert, professor, Neurochirurgische Klinik der Universitat, Freiberg, Germany. The Symposium chairman is Dr. Irving S. Cooper, professor of research surgery, department of surgery, NYU Post-Graduate Medical School. Panel topics and moderators include:

Neuroanatomical and Physiological Consideration Related to Basal Ganglia Surgery in Humans, Ray S. Snider, Ph.D., Chicago.
Technical Aspects of Surgery of the Basal Ganglia in Humans, Dr. A. Earl Walker, Baltimore.
Results and Effects of Basal Ganglia Surgery in Humans, Dr. Percival Bailey, Chicago.
Neurologic and Physiologic Implications of Current Investigations Concerned with Basal Ganglia Operations in Humans, Dr. Irving S. Cooper.

For information write Miss Dorothy P. Frome, Office of Public Relations, 550 First Ave., New York 16.

NORTH CAROLINA

State Medical Meeting in Asheville.—The 104th annual session of the Medical Society of the State of North Carolina will be held May 4-7 in Asheville, with headquarters at the Battery Park and George Vanderbilt hotels. The presidential address will be given May 6 by Dr. Edward W. Schoenheit, of Asheville. The following out-of-state speakers are listed: Drs. Francis B. Berry, Assistant Secretary of Defense, Washington, D. C.; David A. Cooper, Philadelphia; Marcus M. Ravitch, Baltimore; Wilfred Bloomberg and Howard F. Root, Boston; Charles M. Nice Jr., Minneapolis; James Watt, Bethesda, Md.; and Joseph F. Artusio Jr., New York City. A panel discussion, "Alternative Viewpoints on Controversial Surgical Problems," will be moderated by Dr. William W. Kitchin, Clinton, May 5. Symposiums, audiovisual sessions, and scientific and technical exhibits are planned. The presidential dinner will be held May 6. A skeet shoot and ladies' program are arranged. For information write Mr. James T. Barnes, Executive Secretary, Medical Society of the State of North Carolina, 203 Capitol Club Bldg., Raleigh, N. C.

PENNSYLVANIA

Public Health Week May 11-17.—This year's observance of Pennsylvania Public Health Week May 11-17 will again emphasize the need of "More Hands for Health," calling attention to the many careers that are open in the health field to high school and junior college sudents. Co-sponsors of the week's activities are the following agencies: Pennsylvania State Departments of Health and Public Instruction; Pennsylvania League for Nursing; Pennsylvania Health Council; The Medical Society of the State of Pennsylvania; Pennsylvania Nurses Association; Pennsylvania Hospital Association; Pennsylvania Public Health Association; Pennsylvania Tuberculosis and Health Society; and Pennsylvania Association of Sanitations. Programs planned for the week will include school health assemblies devoted to health careers, field trips conducted by public health workers, panel discussions, visits to hospitals and local health departments, distribution of literature, and feature articles in newspapers.

Philadelphia

Program for Study of Uterine Cancer.—A broader program for the study and treatment of uterine cancer has been made available at the Temple University Medical Center, financed by a $20,000 grant from the National Advisory Council of the U. S. Public Health Services. Dr. Clayton T. Beecham, clinical professor of obstetrics and gynecology, to whom the grant was awarded, announced that patients to be included in the study will be seen first at the regular Gynecology Clinic in the hospital's outpatient department. The program will include all diagnostic and therapeutic cancer problems at the center.

University News.—A grant of $150,000 to the Woman's Medical College of Pennsylvania from the Avalon Foundation has been received, Mr. John B. Prizer, chairman of the college's Board of Corporators, has announced. This gift is for the construction of the new Research Wing, which will be built at a cost of more than two million dollars, contracts for which are to be let by July 1.——The election of Dr. Wynne Sharples, president, National Cystic Fibrosis Research Foundation, and Dr. Richard A. Kern, emeritus professor of medicine, to the Temple University Board of Trustees was announced in February. Both physicians will serve on the Committee on Hospital Affairs.

SOUTH DAKOTA

State Medical Meeting in Huron.—The 77th annual meeting of the South Dakota State Medical Association will be held May 17-20 at the Marvin-Hughitt Hotel, Huron. Guest speakers include Drs. Ormond S. Culp, John S. Welch, and Paul R. Lipscomb, Rochester, Minn.; C. Paul Winchell and Richard G. Lester, Minneapolis; Charles L. Schneider, Dearborn, Mich.; Franz Altmann and Milton Friedman, New York City; Ralph V. Platou, New Orleans; Russell B. Roth, Erie, Pa.; Thomas J. E. O'Neill, Philadelphia; John A. Rowe, Ph.D., Kansas City, Mo.; and Benjamin M. Gasul, Chicago. The fourth general session will be a joint meeting with the South Dakota Heart Association. Two films are scheduled: "Curare" and "Patent Ductus Arteriosus." The annual banquet will be held May 19, 7 p. m., with Dr. Roth as speaker. Luncheon meetings, panel discussions, and exhibits are planned. Arrangements for golf and a ladies' program have been made. Registration fee is $5. For information write the South Dakota Sate Medical Association, 300 First National Bank Building, Sioux Falls, S. D.

VIRGINIA

Appoint Department Chairman.—Dr. William S. Jordan Jr. has been appointed professor of preventive medicine and chairman of the department of preventive medicine and professor of internal medicine at the University of Virginia School of Medicine, Charlottesville, Dr. Thomas H. Hunter, dean of the School of Medicine, has announced. His appointment is effective May 1. Dr. Jordan, who has done research in epidemiology, immunology, and virology, was a member of the department of preventive medicine at at Western Reserve University School of Medicine, participated in an intensive 10-year investigation of illnesses in a group of Cleveland families. He spent three years in the Navy, after which he became assistant resident on the medical service at Boston City Hospital and the following year went to Western Reserve School of Medicine as a teaching fellow in internal medicine and preventive medicine.

GENERAL

Prizes for Observations in General Practice.—The 1958 Benger Prizes for Original Observations in General Practice, presented by Benger Laboratories Limited, of Toronto, Canada and Cheshire, England, and adjudicated by the British College of General Practitioners, have been announced. Their aim is "to bring into the light the unpublished discoveries or ideas of individual general practitioners so that they may be considered and explored by all." Entry is open to any family doctor in any part of the world. Nearly 100 entries for the 1957 prizes were received, coming from 12 different countries. The winner of the first prize $700 is Dr. Evan H. Evans of Rockingham Station, Nova Scotia, whose subject was "The Susceptible State to Viral Infections." Entries for the 1958 awards must be received by the Chairman of the Awards Committee, The College of General Practitioners, 54 Sloane St., London, S. W. 1, England, by July 31.

Annual Meeting on Neoplastic Diseases.—The American Association for the Study of Neoplastic Diseases will hold its annual meeting May 22-24 with headquarters the Greystone Hotel, Gatlinburg, Tenn. The program will cover newer techniques in cancer diagnosis, including autoradiography and cytodiagnosis. Presentations of microscopic specimens and radiologic studies relative to the cases under discussion will be made May 22 and 23. May 24 will be spent at Oak Ridge, where the staff of the Oak Ridge Institute of Nuclear Studies will present unpublished material on neoplasia. There will also be a tour of the facilities of Oak Ridge. Presentations and discussions are informal and microscopes are used. Those having cases of interest to present should write to Dr. Victor Levine, Chairman of the Program Committee, 30 N. Michigan Ave., Chicago. For reservations write the Executive Secretary, American Association for the Study of Neoplastic Diseases, P. O. Box 268, Gatlinburg, Tenn.

Annual Meeting of Psychoanalysts.—The American Psychoanalytic Association will hold its annual meeting May 9-11 at the Hotel Fairmont, San Francisco. Over 30 papers are scheduled with discussions to follow, including "Creative Ego Conflict" by Dr. Anton Ehrenzweig, London, England. Four panel discussions will be presented with the following moderators:

Psychological Consequences of Physical Illnesses in Childhood, Edith Buxbaum, Ph.D., Seattle.
Isolation, Dr. Victor H. Rosen, New York City.
The Theory of the Conversion Process, Dr. Felix Deutsch, Cambridge, Mass.
Phobias and Their Vicissitudes, Anna Maenchen, Ph.D., Berkeley, Calif.

Fees for the meeting will be $5 for members and $10 for professional guests. A supper dance ($8.50) is planned for May 9. For information write Mr. John N. McVeigh, Executive Secretary, The American Psychoanalytic Association, 36 W. 44th St., New York 36.

Meeting of English-Speaking Orthopedic Associations.—A joint meeting of the Orthopaedic Associations of the English-Speaking World will be held May 11-16 at the Shoreham Hotel, Washington, D. C. British, Canadian, Australian, New Zealand, South African, and American associations will be represented. The program includes the following *symposium topics and chairman:*

Orthopaedic Problems in Children, Dr. Norman Capener, president, British Orthopaedic Association.
Arthritis, Dr. Arthur J. Helfet, president, South African Orthopaedic Association.
Fractures, Dr. George W. Armstrong, president, Canadian Orthopaedic Association.
Surgical Implants in Modern Surgery, Dr. Capener and Dr. Joseph S. Barr, Boston.
Bone Tumors, Dr. John B. Colquhoun, president, Australian Orthopaedic Association, and Dr. Henry W. Fitzgerald, president, New Zealand Orthopaedic Association.

A program of ladies' activities is arranged. The American and Canadian associations will hold receptions May 12 and 13, respectively. For information write Dr. Harold A. Sofield, Secretary, 715 Lake St., Oak Park, Ill.

Pediatricians Meet in Atlantic City.—The 68th annual meeting of the American Pediatric Society will be held May 8-9 at the Traymore Hotel, Atlantic City, N. J. Dr. Alexander A. Weech, Cincinnati, will present the president's address to open the scientific sessions. Of the 24 papers presented at the four sessions (81 papers will be read by title) the following will include foreign participants:

A Study of the Spectrum and Genetics of Nephrogenic Diabetes Insipidus, Drs. Seymour R. Kaplan and Ayse M. Yuceoglu, New York City, and J. Strauss, Buenos Aries, Argentina.
Erythrocyte Phosphate Metabolism in Infancy, Dr. Alvin Zipursky, Winnipeg, Manitoba, Canada.
Aldosteronism and Hypertension: The Influence of Complete Adrenalectomy Upon Essential Hypertension in a Child, Dr. Robert J. Slater, Dr. Douglas W. Geiger, Dr. Helen J. Leeson, and A. G. Gornall, Ph.D., Trononto, Ontario, Canada.
Adaptations of the Newborn Infant's Cardiovascular and Pulmonary Systems to Extrauterine Life, Drs. Forrest H. Adams, Los Angeles, and Jonas P. Karlberg and John Lind, Stockholm, Sweden.

For information write Dr. Aims C. McGuinness, Secretary, American Pediatric Society, 2800 Quebec St., N. W., Washington 8, D. C.

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CORRECTIONS

Hexafluorodiethyl Ether—An Inhalant Convulsant.—In the initial summary of the article in The Journal, March 29, 1958, page 1555, the first sentence should read "Twenty-five patients" (not Seventy-five) "received 288 convulsive therapy treatments."

Patients Treated for Uterine Cancer.—Dr. Lewis C. Scheffey writes that in his article entitled "Observations on Survival of Patients Treated for Uterine Cancer" in The Journal, April 5, 1958, page 1694, the sentence beginning with "In 1955 . . ." in the second paragraph should read as follows: "In 1955 Emge[1] brought our attention to the fact that 82, 174, and 138 patients with untreated cancer of the corpus, cervix, and ovary, as reported to the California State Tumor Registry between 1942 and 1946 and followed for 5 years as of 1951, presented five-year survival rates of 19.5, 13.8, and 0.0% respectively."

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Written.* Various locations, July 17, 1959. Final date for filing application is January 17, 1959. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford.

American Board of Dermatology: *Written. Several Cities,* June 30. *Oral.* Detroit, Oct. 17-19. Final date for filing all applications is April 1. Sec., Dr. Beatrice Maher Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *Written.* Oct. 20, 1958. *Oral.* Philadelphia, April 23-26; San Francisco, June 18-21; Chicago, Oct. 13-16. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: Applications for certification, new and reopened, Part I, and requests for re-examination Part II, are now being accepted. All candidates are urged to make such application at the earliest possible date. Deadline date for receipt of application is September 1, 1958. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), January 1959. Final date for filing application is July 1, 1958. *Oral Examinations* 1958 (Part II): San Francisco, June 17-21; Chicago, Oct. 17-22. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

American Board of Orthopaedic Surgery: *Part II.* Chicago, Jan. 21-23, 1959. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 6-9. Final date for filing application is March. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pathology: San Francisco, June 30-July 2. Final date for filing application is May 1. Sec., Dr. Edward B. Smith, Indiana University Medical Center, 1042-1232 W. Michigan St., Indianapolis 7.

American Board of Pediatrics: *Oral.* Atlantic City, May 3-5; Cincinnati, June 13-15; Chicago, Oct. 24-26 and New York, Dec. 5-7. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Physical Medicine and Rehabilitation: *Oral and Written.* Peoria, Ill., June 20-21. Final date for filing application was Feb. 1. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

American Board of Plastic Surgery: *Oral and Written.* Galveston, Texas, May 18-20. Corresponding Secretary, Miss Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

American Board of Preventive Medicine: *Occupational Medicine,* April 18-20. Final date for filing application was Jan. 30. *Public Health* on a Regional Basis, April. Final date for filing application is Jan. 30. Sec., Dr. Tom F. Whayne, 3438 Walnut St., Philadelphia 4.

American Board of Proctology: *Oral and Written, Parts I and II.* September 1958. Final date for filing application is March 15. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Special Examination in Nuclear Medicine for Diplomates in Radiology or Therapeutic Radiology,* Chicago, May 17. Deadline for filing application was Feb. 1. *Regular Examination in Radiology,* Chicago, May 19-23. Final date for filing application was Jan. 1. *Regular Examination in Radiology.* Washington, D. C., Dec. 8-12. Final date for filing application is July 1. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: *Oral (Part II).* Chicago, May 12-13; Los Angeles, June 16-17; Portland, June 20-21. Written examinations (Part I) will be held at various centers in the United States, Canada, Hawaii, Puerto Rico, and certain military centers abroad on December 3. The date of the Fall examination in *Part I* has been changed from the last Wednesday of October as announced in its current Booklet of Information to December 3, 1958. Thereafter, examinations in Part I will be held once annually, on the first Wednesday of December. The closing date for filing applications will be August 1. *Part II.* Baltimore, March 10-11. Sec., Dr. John B. Flick, 225 So. 15th St., Philadelphia 2.

Board of Thoracic Surgery: *Oral.* Boston, May 12-13. Final date for filing application was December 1. The fall written examination will be given in September 1958 and closing date for registration is July 1. Registration for the fall oral examination closes July 1.

DEATHS

Alexander, Oliver Ostrom ⊕ Terre Haute, Ind.; born in 1887; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909; member of the founders group of the American Board of Surgery; member of the Western Surgical Association; fellow of the American College of Surgeons; served as secretary, vice-president, and president of the Vigo County Medical Society; past-president of the Terre Haute Academy of Medicine; for many years councillor and for eight years chairman for the Fifth District of the Indiana State Medical Association; veteran of World War I; member of the staff of the Union Hospital; died Feb. 23, aged 70, of cerebral thrombosis and arteriosclerosis.

Allen, Sylvester C. E. ⊕ Waterloo, Wis.; Marquette University School of Medicine, Milwaukee, 1914; associated with St. Mary's Hospital, Watertown, St. Mary's Hospital, Columbus, and St. Mary's and Methodist hospitals in Madison; died in Madison Feb. 26, aged 68.

Anderson, John Carlisle, Chatham, Va.; University College of Medicine, Richmond, 1909; veteran of World War I; died in Sarasota, Fla., Feb. 14, aged 75.

Baer, Herman, Elsinore, Calif., Medical College of the State of South Carolina, Charleston, 1901; an associate member of the American Medical Association; died Feb. 15, aged 78, of coronary occlusion.

Balg, Joseph, New York City; St. Louis University School of Medicine, 1930; resident, Royal Hospital; veteran of World War II; died in Hialeah, Fla., Jan. 27, aged 58, of arteriosclerotic heart disease.

Beek, William G. ⊕ Shorewood, Wis.; Dearborn Medical College, Chicago, 1904; for many years practiced in Chicago; died in the Columbia Hospital Feb. 26, aged 86, of complications of ileitis.

Boice, James Montgomery, St. Petersburg, Fla.; Jefferson Medical College of Philadelphia, 1906; formerly associated with the regional office, Veterans Administration; died in Roanoke, Va., Dec. 1, aged 76, of arteriosclerosis and acute cardiac failure.

Bonsack-Miller, Blanche ⊕ Eglon, W. Va.; University of Cincinnati College of Medicine, 1921; past-president of the Preston County Medical Society; associated with Broaddus Hospital in Philippi, and Garrett County Memorial Hospital in Oakland, Md.; died in Philippi Feb. 27, aged 65, of diabetes mellitus and nephrosis.

Bold, Francis H., Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1909; member of the South Carolina Medical Association; veteran of World War I; served as alderman; died Jan. 25, aged 76, of pulmonary emphysema and bronchiectasis.

Burton, Robert Eldridge, Petersburg, Va.; Leonard Medical School, Raleigh, N. C.; 1903; died Jan. 28, aged 79, of heart disease.

Curry, William Hugh ⊕ Eupora, Miss.; Memphis (Tenn.) Hospital Medical College, 1911; in 1940-41 vice-president of the Mississippi State Medical Association; served as county health officer; died Feb. 19, aged 77, of coronary thrombosis.

Dashiell, Leland Elder ⊕ Colonel, U. S. Army, retired, Alexandria, Va.; University of Louisville (Ky.) Medical Department, 1916; service member of the American Medical Association; veteran of World War I; entered the medical corps of the U. S. Army in 1920; retired Oct. 31, 1945; died in the Walter Reed Army Hospital, Washington, D. C., Jan. 12, aged 66, of arteriosclerotic heart disease.

Ebenstein, Simon Harold, New York City; New York Homeopathic Medical College and Flower Hospital, New York City, 1918; member of the Medical Society of the State of New York; died in the Montefiore Hospital Feb. 12, aged 64, of carcinoma of the lung.

Ellis, Wilbur Sibley ⊕ Pomeroy, Ohio; Miami Medical College, Cincinnati, 1896; formerly county health officer; died in Columbus Feb. 17, aged 83, of arteriosclerosis and cerebral vascular accident.

Fawcett, Ivan ⊕ Wheeling, W. Va.; born in Salem, Ohio, Jan. 31, 1889; University of Pennsylvania School of Medicine, Philadelphia, 1910; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served as president of the Ohio County Medical Society; for many years a member of the House of Delegates of the American Medical Association; formerly president and long-time member of Ogelbay Institute; for many years a trustee of Linsly Military Institute and since 1942 president of its board; on the staff of the Ohio Valley General Hospital, where he died Feb. 4, aged 69.

Friedman, Alexander, New York City; University of Dorpat Faculty of Medicine, Russia, 1886; an associate member of the American Medical Association; died Jan. 24, aged 94, of arteriosclerosis.

⊕ Indicates Member of the American Medical Association.

Hanscom, Ridgely Fernald, Berryville, Va.; Medical School of Maine, Portland, 1913; veteran of World War I; died in Winchester (Va.) Hospital Jan. 23, aged 70, of heart disease.

Harding, Henry Oswi, New York City; New York Homeopathic Medical College and Flower Hospital, New York City, 1913; died in the Sydenham Hospital Jan. 28, aged 72, of carcinoma of the bladder.

Harrington, Harold Francis ⊕ Attleboro, Mass.; Tufts College Medical School, Boston, 1933; for many years associated with Sturdy Memorial Hospital; died Feb. 17, aged 49.

Holcomb, Clarence Chester, Margaretville, N. Y.; College of Medical Evangelists, Loma Linda and Los Angeles, 1930; county coroner; on the staff of the Margaretville (N. Y.) Hospital, where he died Feb. 12, aged 57, of cerebral hemorrhage.

Holland, Claude L., Fairmont, W. Va.; Maryland Medical College, Baltimore, 1901; an associate member of the American Medical Association; specialist certified by the American Board of Pediatrics; fellow of the American College of Physicians; associated with Fairmont General and Fairmont Emergency hospitals; died Jan. 29, aged 79, of cardiovascular renal disease.

Hurtig, Henry G. ⊕ Hanover, Kan.; John A. Creighton Medical College, Omaha, 1912; died Feb. 20, aged 73.

Hutton, Arthur Dixon ⊕ Marion, Va.; Medical College of Virginia, Richmond, 1927; member of the staff of the Southwestern State Hospital; died in Abingdon Feb. 11, aged 60.

Johnson, Harry Edgar, St. Joseph, Mich.; Western University Faculty of Medicine, London, Ontario, Canada, 1910; died in Tampa (Fla.) General Hospital Feb. 22, aged 78, of subarachnoid hemorrhage.

Jones, Alvah Wilber ⊕ Red Wing, Minn.; Georgetown University School of Medicine, Washington, D. C., 1891; for many years city health officer and member of the board of education; died Jan. 3, aged 84.

Lanchner, Samuel Herbert, New York City; New York Homeopathic Medical College and Flower Hospital, New York City, 1913; died Feb. 4, aged 68, of acute coronary occlusion.

Lowry, John Albert Berchard ⊕ Crewe, Va.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1915; member of the American Academy of General Practice; veteran of World War I; served on the board of trustees of Randolph-Macon College in Ashland; a vice-president of the Bank of Crewe; a charter member and past-president of the Crewe Kiwanis Club; died Feb. 4, aged 67, of acute coronary occlusion.

McDonald, Samuel Egbert ⊕ Bells, Tenn.; University of Nashville (Tenn.) Medical Department, 1905; died in the West Tennessee Tuberculosis Hospital in Memphis Jan. 11, aged 81, of pneumonia.

Magruder, Levin Freeland ⊕ Portsmouth, Va.; Medical Department of Tulane University of Louisiana, New Orleans, 1905; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, Radiological Society of North America, and the American College of Radiology; veteran of World War I; formerly on the staff of the Norfolk (Va.) General Hospital, King's Daughters' Hospital, and Maryview Hospital; died Jan. 31, aged 78.

Makarewicz, Stanislaus Joseph, Buffalo, N. Y.; Georgetown University School of Medicine, Washington, D. C.; 1941; veteran of World War II and the Korean War; died in New York City Jan. 18, aged 43, of coronary occlusion and myocardial fibrosis.

Marrow, D. Hunter ⊕ Boydton, Va.; Louisville (Ky.) Medical College, 1888; Jefferson Medical College, Philadelphia, 1889; died in the Community Hospital, South Hill, Feb. 23, aged 91, of cancer.

Marx, Fredrick William ⊕ Holyoke, Mass.; Harvard Medical School, Boston, 1921; certified by the National Board of Medical Examiners; fellow of the American College of Surgeons; member of the staffs of the Holyoke and Providence hospitals; died Feb. 14, aged 64, of pulmonary hemorrhage.

Nilsson, Donald Edwin ⊕ Rockville Centre, N. Y.; New York University College of Medicine, New York City, 1944; served during World War II and the Korean War; on the staff of the Mercy Hospital, where he died Feb. 9, aged 38, of acute myocardial infarction.

Oberg, Carl Magnus ⊕ Minneapolis; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1899; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; on the staff of the Deaconess Hospital; died in the Asbury Hospital Feb. 6, aged 81, of pulmonary embolism, cerebral hemorrhage, and hypertensive cardiovascular disease.

Oden, Thomas Ellsworth, Blackshear, Ga.; University of Nashville (Tenn.) Medical Department, 1900; an associate member of the American Medical Association; veteran of World War I; on the staff of the Pierce County Hospital; died in the Memorial Hospital, Waycross, Feb. 10, aged 81.

Oldenburg, Ray William ⊕ Klamath Falls, Ore.; University of Colorado School of Medicine, Denver, 1925; veteran of World War I; associated with

Klamath Valley and Hillside hospitals; died Feb. 9, aged 60, of acute carbon monoxide intoxication, resulting from a fire in the rear of his home.

Osborne, Harry S. ⊕ Umatilla, Fla.; Kentucky School of Medicine, Louisville, 1900; member of the Indiana State Medical Association; died in the Waterman Memorial Hospital, Eustis, Feb. 1, aged 80, of multiple myeloma.

Owens, Charles Clinton, Smithville, Texas; Meharry Medical College, Nashville, Tenn., 1910; died Feb. 10, aged 69, of a heart attack.

Patterson, Robert Rhoode, Rochester, N. Y.; Cornell University Medical College, New York City, 1905; an associate member of the American Medical Association; died Feb. 26, aged 79.

Pittis, Harold, Lakehurst, N. J.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1901; served as mayor and postmaster of Lakehurst; died in the Paul Kimball Hospital in Lakewood Feb. 12, aged 81, of acute myocardial infarction and arteriosclerosis.

Points, Blair, Oklahoma City, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1911; service member of the American Medical Association; formerly associated with the U. S. Public Health Service; at one time practiced in Independence, Kan., where he was health officer of Montgomery County; served as adjudication officer and medical specialist with Veterans Administration; died Feb. 10, aged 73, of carcinoma of the rectum.

Rath, Russell Robert, Granton, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1906; served as president and secretary of the Clark County Medical Association; veteran of World War I; formerly county coroner; died in Fond du Lac Dec. 12, aged 73, of coronary disease.

Raudenbush, James Stricker, Chatham, Pa.; Medico-Chirurgical College of Philadelphia, 1897; an associate member of the American Medical Association; died Jan. 22, aged 89, of cancer.

Ray, J. Edwin, Santa Barbara, Calif.; Kansas City (Mo.) Medical College, 1905; veteran of World War I; died Feb. 8, aged 77, of heart disease.

Reynolds, Stephen Woodson ⊕ Drumright, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1914; veteran of World War I; died Feb. 3, aged 66, of coronary thrombosis.

Riaboff, Peter John ⊕ New York City; Kazan Medical Institute, Kazan, Russia, 1916; member of the American Urological Association; associated with Memorial, St. Clare's, and New York hospitals; died Feb. 28, aged 64, of heart failure.

Riddell, William Crosby, Seattle; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886; fellow of the American College of Surgeons; veteran of World War I; formerly practiced in Helena, Mont., and served as secretary of the Montana State Board of Medical Examiners; died Jan. 14, aged 93, of heart disease.

Rife, Jay Wilson, Kenova, W. Va.; University of Louisville (Ky.) Medical Department, 1908; an associate member of the American Medical Association; surgeon for the Norfolk and Western Railway and the Chesapeake and Ohio Railway; president of the First National Bank; associated with Cabell General Hospital, St. Mary's Hospital, and the Memorial Hospital in Huntington, where he died Feb. 13, aged 74, of mesenteric thrombosis following a surgical operation.

Roberts, Delparde Washington ⊕ Milwaukee; University of Arkansas School of Medicine, Little Rock, 1911; formerly clinical professor of psychiatry at Marquette University School of Medicine; a founder and first secretary-treasurer of the Milwaukee Neuropsychiatric Society, of which he was an honorary life member; for many years associated with the Sacred Heart Sanitarium; died Feb. 16, aged 73.

Rosenzweig, Samuel, New York City; University and Bellevue Hospital Medical College, New York City, 1906; an associate member of the American Medical Association; associated with the Lebanon Hospital, where he died Feb. 6, aged 73, of arteriosclerotic heart disease.

Salvati, Leo Harry ⊕ Westfield, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1924; fellow of the International College of Surgeons and the American College of Surgeons; served as treasurer of the Society of Surgeons of New Jersey; veteran of World War I; on the staff of the Muhlenberg Hospital in Plainfield, where he died Feb. 13, aged 61, of coronary thrombosis.

Sanders, E. Gerry ⊕ Stantonville, Tenn.; Vanderbilt University School of Medicine, Nashville, Tenn., 1894; died Dec. 26, aged 79, of coronary thrombosis.

Savage, Millard Bridgman ⊕ Norfolk, Va.; University of Virginia Department of Medicine, Charlottesville, 1921; specialist certified by the American Board of Obstetrics and Gynecology; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; past-president of the Norfolk County Medical Society; served as president of the Virginia Obstetrical and Gynecological Society; veteran of World War I; associated with Norfolk General, DePaul, and Leigh Memorial hospitals; died Feb. 10, aged 61.

Schneider, Julius Frederick ⊕ Atlanta, Ga.; College of Medical Evangelists, Loma Linda and Los Angeles, 1921; member of the American Academy of General Practice; on the staff of the Crawford W. Long Memorial Hospital; died Feb. 9, aged 66, in a private plane accident.

Schwartz, Philip Herman ⊕ Towanda, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1912; served as president of the Bradford County Medical Society; member of the board of health of Towanda; died Jan. 28, aged 70, of cardiac decompensation.

Sekerak, Arthur Joseph Francis ⊕ Bridgeport, Conn.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1922; past-president of the Bridgeport Medical Society; associated with St. Vincent's Hospital, where he served as secretary treasurer, vice-president, and president of the staff, and where he died Feb. 19, aged 59, of heart disease.

Shankwiler, Reed Albert, Detroit; University of Maryland School of Medicine, Baltimore, 1909; veteran of World War I; died in the Receiving Hospital Feb. 14, aged 72, of acute myocardial infarction, and diabetes mellitus.

Slayne, Joseph Francis, Elmhurst, N. Y.; Georgetown University School of Medicine, Washington, D. C., 1933; member of the Medical Society of the State of New York; died in St. Catherine's Hospital in Brooklyn Feb. 24, aged 52, of myocardial infarction.

Sloan, Lilliard Rudolphus ⊕ Carthage, Tenn.; University of Tennessee College of Medicine, Memphis, 1937; died Jan. 28, aged 47, of coronary heart attack.

Smith, David Parker, Meriden, Conn.; Yale University School of Medicine, New Haven, 1912; fellow of the American College of Surgeons; served overseas during World War I; associated with the Meriden Hospital and the Memorial Hospital, where he was chief of staff and president; died Feb. 1, aged 68, of coronary occlusion.

Sonnenfeldt, Walther Herbert ⊕ Sykesville, Md.; Hamburgische Universität Medizinische Fakultät, Hamburg, Germany, 1921; member of the American Psychiatric Association; served on the staff of the Springfield State Hospital; died in the University Hospital, Baltimore, Feb. 11, aged 65, of metastatic neoplastic disease.

Stahlman, Thomas Mervin ⊕ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1905; died Feb. 25, aged 83.

Starnes, William Love, Colonel, U. S. Army, retired, San Antonio, Texas; University of Texas School of Medicine, Galveston, 1914; veteran of World Wars I and II; entered the regular Army in 1917 and retired Oct. 31, 1946; for many years superintendent of the San Antonio State Hospital; died in Pensacola, Fla., Feb. 15, aged 70, of myocardial infarction.

Stevenson, Thomas William ⊕ New York City; born in Salt Lake City, Utah, March 27, 1904; Harvard Medical School, Boston, 1929; professor of clinical surgery at Columbia University College of Physicians and Surgeons; certified by the National Board of Medical Examiners; specialist certified by the American Board of Plastic Surgery; member of the American Association of Plastic Surgery, American Society for Surgery of the Hand, of which he was past-president, and the American Society of Plastic and Reconstructive Surgery; fellow of the American College of Surgeons; associated with the Presbyterian Hospital and the Vanderbilt Clinic; consultant in plastic surgery, Northern Westchester Hospital in Mount Kisco and the New York Orthopedic Hospital and Dispensary; died Feb. 22, aged 53, of a brain tumor.

Stewart, Acheson, Winter Park, Fla.; Jefferson Medical College of Philadelphia, 1901; fellow of the American College of Surgeons; member of the American Urological Association; died Jan. 2, aged 80, of carcinomatosis, squamous-cell carcinoma of the hand, and x-ray burns of the hand.

Stitt, Howard Leigh ⊕ Cincinnati; Medical Department of the University of Cincinnati, 1910; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, American Soc [illegible] and Otolaryngologic Allergy, and the American Broncho-Esophagological Association; served on the staffs of the Deaconess, Children's, Good Samaritan, and St. Francis hospitals, and St. Mary Hospital; died in the Drake Memorial Hospital Feb. 15, aged 73, of empyema.

Street, Glenn Q. Jr. ⊕ Wichita, Kan.; Tulane University School of Medicine, New Orleans, 1938; member of the American Psychiatric Association; past-president of the Wichita Psychiatric Association; veteran of World War II; died Feb. 16, aged 45.

Templeton, Edward Wood ⊕ Seattle, Wash.; Jefferson Medical College of Philadelphia, 1915; for many years practiced in Snoqualmie, Wash.; died Feb. 11, aged 67, of coronary thrombosis.

Thomson, James Lachlison, Darien, Ga.; Emory University School of Medicine, Atlanta, 1939; veteran of World War II; on the staff of the Glynn County Hospital; died Feb. 15, aged 43, of coronary occlusion.

Turk, George Rufus, Snyder, N. Y.; University of Buffalo School of Medicine, 1897; an associate member of the American Medical Association; for many years practiced in Buffalo, where he was associated with the Emergency Hospital; died in the Buffalo General Hospital Feb. 6, aged 89, of cerebrovascular accident and aspiration pneumonia.

Turner, Robert D. ⊕ Muncie, Ind.; Indiana University School of Medicine, Indianapolis, 1936; died Feb. 28, aged 54, of hypertensive cardiovascular disease.

Velon, Bruce Philip ⊕ Taunton, Mass.; Middlesex University School of Medicine, Waltham, 1937; veteran of World War II; died Feb. 10, aged 45.

Walker, Micajah Theodore, Washington, D. C.; Howard University College of Medicine, Washington, D. C., 1921; veteran of World War I; on the staff of the Freedmen's Hospital; died Feb. 26, aged 69, of a heart attack.

Wallace, John Asher ⊕ San Bernardino, Calif.; University of Colorado School of Medicine, Denver, 1930; on the staff of St. Bernardine's Hospital; died Feb. 4, aged 53, of heart disease.

Watts, Herbert Charles, San Francisco; University of California School of Medicine, San Francisco, 1900; fellow of the American College of Physicians; veteran of the Spanish-American War and World War I; served as manager of the Veterans Administration Hospital in Fort Harrison, Mont.; died Feb. 10, aged 83, of fibrosarcoma, originating in right inguinal region.

Weber, Ewald, Chicago; Chicago College of Medicine and Surgery, 1910; died March 15, aged 93.

Webster, James Randolph ⊕ Chicago; born in Chicago Oct. 16, 1906; Rush Medical College, Chicago, 1932; professor of dermatology at Northwestern University Medical School; specialist certified by the American Board of Dermatology and Syphilology; representative to the Scientific Exhibit from the Section on Dermatology of the American Medical Association from 1951 to 1953; president of the American Academy of Dermatology and Syphilology, of which he was secretary-treasurer; past-president of the Chicago Dermatological Society; veteran of World War II; in 1957 was an American delegate to the International Congress of Dermatology in Stockholm; associated with Cook County Hospital and the Wesley Memorial Hospital, where he died Feb. 28, aged 51, of pulmonary emphysema.

Weissman, Adolph ⊕ New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1927; member of the American Rheumatism Association and the American Academy of General Practice; senior clinical assistant physician at Mount Sinai Hospital; died Feb. 17, aged 57, of coronary occlusion.

Werner, George Charles, Kenosha, Wis.; Marquette University School of Medicine, Milwaukee, 1951; veteran of the Korean War; resident at the Indiana University Medical Center in Indianapolis, where he died in his sleep Feb. 2, aged 31.

Wilhelm, Seymour Frederick ⊕ New York City; born in New York City April 2, 1900; Columbia University College of Physicians and Surgeons, New York City, 1921; associate clinical professor of urology at New York University College of Medicine and New York Post-Graduate Medical School; specialist certified by the American Board of Urology; member of the American Urological Association and the Endocrine Society; fellow of the American College of Surgeons; chief of the urological service and past-president of the medical board of Beth Israel Hospital; died Feb. 15, aged 57, of coronary artery disease.

Wilhelmus, William M. ⊕ Evansville, Ind.; Louisville and Hospital Medical College, Louisville, Ky., 1908; on the staffs of St. Mary's Hospital and the Deaconess Hospital, where he died Feb. 13, aged 76, of pneumonia.

Winters, Matthew ⊕ Bloomington, Ind.; born in Wadesville, Ind., May 15, 1890; Rush Medical College, Chicago, 1922; served as professor and chairman of the department of pediatrics at the Indiana University School of Medicine; physician at the Indiana University Student Health Center; specialist certified by the American Board of Pediatrics; fellow of the American Academy of Pediatrics; veteran of World War I; past-president of the Indiana University Alumni Association; in February, 1957, received the faculty man award from the Indiana University chapter of Nu Sigma Nu; for many years associated with the Methodist Hospital, St. Vincent's Hospital, and James Whitcomb Riley Hospital, all in Indianapolis, died Feb. 14, aged 67, of cerebral hemorrhage.

Wright, Robert Herring Jr. ⊕ Phoebus, Va.; University of Pennsylvania School of Medicine, Philadelphia, 1929; past-president, secretary, and treasurer of the Virginia Academy of Medicine; associated with Dixon Hospital, Hampton, and the Mary Immaculate Hospital in Newport News, where he died Jan. 13, aged 52, of dissecting aneurysm of the ascending aorta.

Zaretzki, Louis Elihu, Great Neck, N. Y.; Columbia University College of Physicians and Surgeons, New York City, 1928; specialist certified by the American Board of Radiology; served during World War II and was awarded two Bronze Stars; associated with Mount Sinai Hospital in New York City; died in the Long Island Jewish Hospital, New Hyde Park, Feb. 24, aged 54, of coronary thrombosis.

FOREIGN LETTERS

AUSTRIA

Effect of Aural Muscles on Audiometry.—At the meeting of the Austrian Oto-Laryngological Society in Vienna in January, Drs. H. Pichler and H. Bornschein of the University in Vienna said they had worked out a way to demonstrate the effect of the intra-aural muscles on the audiometric picture. Their method consists of eliciting a nonacoustic reflex contractions of these muscles so that difficulties or masking effects, as they may occur with simultaneous *acoustic stimulation* and *subjective* auditory threshold determinations, can be avoided. The reflex is elicited by unilateral electrical stimulation of the skin of the outer auditory canal by means of a specially constructed tube-like double electrode. Their studies were carried out in 10 volunteers with normal hearing who were between the ages of 19 and 37 years. They were tested at each of 12 frequencies. In the homolateral ear a highly significant loss of sensitiveness in the lower frequency range to 1,000 cycles per second inclusive in the order of from 10 to 15 decibels was determined, while only a suggestive weakly confirmed threshold increase was found in the contralateral ear. This test can be carried out with simple means, even in patients with severe hearing loss and is of clinical interest in detecting certain disturbances of sound-conduction.

Recurrent Nephrolithiasis.—At the meeting of the Society of Physicians in Vienna on March 7, Dr. E. Kiesewetter reported on a patient with recurrent nephrolithiasis who was treated exclusively with hyaluronic acid for four years because the risk of further operations was too great. The application of hyaluronic acid was based on successful experiments performed on animals and on the speaker himself. In the patient pyuria was controlled, the serum level of nonprotein nitrogen returned to normal, and he was able to resume fulltime work. Although the stone formation did not improve, the therapeutic results exceeded those observed with any other form of treatment.

Poisoning from Soporifics.—At the same meeting, Dr. G. Hofmann reported on the use of neuroplegic drugs against the neurogenic fever that occurs in the course of poisoning from soporifics and results in the death of most patients. The commonly used antipyretics were ineffective in the treatment of such patients. Five patients with serious poisoning from soporific drugs were given 0.33 mg. of chlorpromazine and promethazine. All recovered.

Treatment of Inflammations with Microwaves.—At the same meeting, Dr. V. Gruenberger reported on a series of 100 women with pelvic inflammatory disease who were treated with the microwave apparatus, Radartherm. The irradiations were applied alternately through the abdominal wall and through the vagina. Fifty-four of the patients with acute, subacute, and chronic inflammation were cured, 41 were improved, and only 5 were not benefited.

Bronchial Foreign Bodies.—At the meeting of physicians in Vienna on Jan. 24, Dr. A. Riccabona pointed out that a roentgenogram cannot definitely exclude the presence in a bronchus of a foreign body, even if it is a bone. In all doubtful cases endoscopy is advisable. Dr. H. Jenny stated he had done about 2,500 bronchoscopies mostly with the patient under general anesthesia. Foreign bodies, not visible in the roentgenogram, included lemon seeds, sausage skin, bones, pine needles, and pharmaceutical tablets. With most patients the removal of the foreign body was sufficient, but about 15 required pulmonary resection. Dr. K. H. Prausmueller said that aspirated foreign bodies have remained in the bronchus for years without causing symptoms. The roentgenogram of a patient who was suspected of having bronchial carcinoma showed atelectasis of a segment of the inferior lobe. The bronchoscopy revealed obstruction of the collapsed segment of the inferior lobe by granulation tissue. After the removal of the granulation tissue air could pass again through the bronchial branch. The next day the patient expectorated an inspired bone 2 cm. long. He recalled later that he had "swallowed" it four years earlier.

Niacin and Cholesterol Metabolism.—At the same meeting Drs. O. Kraupp and E. Schnetz stated that at the Mayo Clinic Altschul and co-workers had observed that niacin leads to a lowering of the serum cholesterol level in patients with hypercholesteremia. A reexamination of these findings in dogs and rabbits, with or without previous loading with cholesterol, revealed that after intravenous administration of up to 100 mg. of niacin per kilogram of body weight only that portion of cholesterol in the serum which was determined by means of alcohol-acetone precipitation showed a decrease, while that determined according to the

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The items in these letters are contributed by regular correspondents in the various foreign countries.

method of Zlatkis showed no change. Intravenous administration of heparin five hours after that of niacin led to a temporary increase of the serum cholesterol value ascertained with the aid of alcohol-acetone precipitation.

It is assumed that as a result of the action of the niacin a change of the serum cholesterol from the lipoid-soluble to the water-soluble protein bound form takes place whereby the cholesterol is separated again from the protein component through the postheparin-clearing ferment by lipoproteolysis. Since preceding treatment with trypan blue temporarily completely checked the effect of niacin on the cholesterol metabolism in rabbits, it seems that the cells of the reticuloendothelial system should be considered as a point of attack of the action of niacin on the cholesterol metabolism. Prolonged administration of niacin in daily doses of 100 mg. per kilogram of body weight in rabbits with alimentary hypercholesteremia experimentally produced affected the serum cholesterol level only during the first two weeks. No effect could be demonstrated later despite the continued administration of niacin. All the rabbits showed symptoms of severe hypercholesteremia with continued administration of cholesterol in the food. It is suggested that the cause of the clinically observed decrease of the effect of niacin on prolonged administration may be the result of a saturation of the reticuloendothelial system with cholesterol.

Neurological Sequelae of Influenza.—At the meeting of the Society of Physicians in Vienna on Feb. 14, Drs. F. Gerstenbrand and K. Weingarten reported on the transmission, symptoms, and prognosis of the neurological complications after Asian influenza. More than 30 patients were observed with a variety of psychiatric and neurological sequelae. The guiding symptom in one group consisted of mental confusion, somnolence, fever, and abnormal spinal fluid findings. Five of these patients died. Those of the second main group had a benign course without any spinal fluid changes, but with marked neurological symptoms, especially those of foci in the brain stem. Although there was no virological proof and the results of postmortem examinations were not complete, it seemed probable that there was a causative relationship between influenza and encephalitis because of the unequivocal relationship with time. The patients showed mild confusion such as is observed in those with alcoholism or lethargic encephalitis, but not like the initial delirium associated with epilepsy. Otological complications were also observed, even with objective changes in cochlear and vestibular nerves.

Treatment by Artificial Climate.—At the same meeting, Dr. W. Ledwina reported on the use of clear steam. About 100% humidity and a temperature of 26 to 38 C (78.8 to 100.4 F) is required to obtain a warm humid environment. This clear steam environment conveys about as much humidity to the respiratory tract as is given off by it. Under such conditions moistening of the dry mucosa, loosening of the tenacious glairy mucus of the asthmatic, and relief of bronchial spasms occurring in bronchitis is possible. The speaker also subjected patients with uncomplicated pertussis to air pressures corresponding to those met at 12,000 ft. above sea level three times every two days. Immediately after the third treatment many patients became free from attacks. It is also possible to maintain most asthmatic children free from attacks by a rotating course of such treatment.

Second Physicians' Strike.—The plenary session of the hospital staff physicians of the Chamber of Physicians in Vienna on March 12 decided that they should go on a warning strike for one day in order to support the demands made on the city of Vienna and the owners of private hospitals last November. They were supported by a sympathy strike of the physicians at the university clinics. In addition to demands concerning legal regulations, the staff physicians who receive a monthly salary of $60 to $80 sought (1) an increase in the additional allowances for night duty from $1.17 to $2.34 per night for the first to the eighth night on duty in the course of one month; for an additional night (from the ninth on), a payment of $3.80; and for services given on a Sunday or holiday, a like payment; (2) an allowance for additional services and for services given under particularly difficult circumstances of 15% of the basic salary; and (3) an additional allowance for those in such special departments as pathology, tuberculosis, pediatrics, x-ray and radium-irradiation, isotope institutes, laboratories, and mental institutions, amounting to $9.50 a month. The hospital physicians in these departments should also be entitled to one extra vacation day for each month they are assigned to these departments. The residents wanted to accelerate by their action the current negotiations and to call once more the attention of the public to their modest demands. During the warning strike on Saturday, March 15, the usual Sunday or holiday emergency services were performed so that the welfare of the patients was not jeopardized. The strike did not affect the institutions of social insurance funds which had already granted the demands of the physicians. Normal service was resumed on March 17.

This is the second time since World War II that Viennese doctors have gone on strike in protest against the injustice of socialized medicine. Although socialized medicine has a utopian appeal, it is impractical because of its inevitable bureaucratic structure. In Austria the administration of the program requires two bureaucrats for each physician and the paper work involved is tremendous. The bureaucrats also want to place the doctors in an economic position inferior to their own. As a result administrative costs for socialized medicine have increased far beyond all reasonable proportions and the physicians are forced to sacrifice themselves for the benefit of the rapidly expanding bureaucratic superstructure.

BRAZIL

New Apparatus for Diathermic Coagulation.—At a meeting of the Associação Paulista de Medicina Dr. A. Bianco presented a new apparatus that permits reversible and irreversible dermohypodermic diathermic coagulation without injury to the superficial layers of the skin. The apparatus consists of an electrode and a temperature regulator connected in parallel which, during the coagulatory application, receives the current from a generator of medium frequency waves. The active part of the electrode is an ordinary injection needle that is completely introduced into the dermohypodermic layers of the skin. During the introduction of the needle an infiltration of 3.5 ml. of a procaine solution is made. The indifferent part of the electrode is a metallic disk 23 mm. in diameter that is applied to the skin so that a distance of 15 mm. is left between the edge of the disk and the point of penetration of the needle, and, at the same time, the vertical plane passing through the needle divides the disk in two equal parts. Control of the temperature is obtained by means of two parallel metallic rods about 5 mm. in diameter, the free extremities of which are applied perpendicularly to the skin at some distance from the point of introduction of the needle. The diathermic current is sufficient to cause, in a couple of minutes, an intense heat in the tissues that are between the rods of the controller. A skin temperature of 40 C near the temperature regulator corresponds to a temperature of 90 C in the tissues in immediate contact with the point of the needle and 40 C near its butt.

Dr. Bianco also presented two patients whose dermatitis had been cured by a single application of the coagulator. One had had a lupus vulgaris of 10 years' duration and the other an ulcer of the leg with bony necrosis. He also presented a patient with a dermohypodermic reaction of moderate severity resulting from a treatment one week earlier. This was characterized by an area of hard infiltration measuring 20 by 10 mm. The epidermis covering the inflammation was normal, and only by palpation could the infiltration be perceived.

Malignant Transformation of Gastric Polyp.—Dr. D. Rosenberg (*Revista paulista de medicina,* vol. 52, 1958) stated that the word "polyp" may be used to designate a neoplasm, hypertrophy, or adenomatous formation such as a nasal polyp. Nonmalignant polyps of the gastrointestinal tract are called adenomatous polyps. Malignant transformation of gastric polyps as determined by autopsies, varies from 0.13 to 0.71%. After adding two case reports the author concluded that (1) despite its relative rarity, the adenomatous polyp of the stomach should be considered a possible cause of hematemeses in patients with negative x-ray findings; (2) gastroscopy is indispensable in such cases; (3) due to the possibility of malignant transformation, a gastrectomy should be performed on patients with multiple lesions or with an isolated lesion larger than 1 cm. in diameter whatever its localization; and (4) simple polypectomy should be reserved for the solitary adenomatous polyp smaller than 1 cm. in diameter.

Filariasis.—The Public Health Service published the findings of a survey made by Dr. O. R. Costa on filariasis in the Amazon valley (the states of Amazonas and Pará, in the equatorial zone of Brazil). The disease is caused mainly by Wuchereria bancrofti and Mansonella ozzardi. Acanthocheilonema perstans, which Belding and Faust claim to have found in this region, has never been found by Costa. Although many authors believe that M. ozzardi is not pathogenic, Costa is convinced that it is since 90 of the 253 persons harboring this parasite were pale and edematous and had varices, numbness, joint pains, and adenitis. In 26 localities in Amazonas, where 6,555 persons were examined, only two patients with autochtonous infection by W. bancrofti were found. In contradistinction to this, filariasis was much more common in Belem, Pará. Microfilarial forms of W. bancrofti showed the highest concentration in the bloodstream between 9 p. m. and 3 a. m., but those of M. ozzardi did not show any diurnal periodicity. The most conclusive method for discovering filariasis was to search for microfilarias in the peripheral bloodstream. This survey confirmed the impression that the most important focus of filariasis in the Amazon valley is the city of Belem with a population of 150,000. Diethylcarbamazine had no effect on the symptoms of the disease but did reduce filaremia. Prevention is effected by control of the larval and the adult stages of Culex fatigans.

CANADA

Unification of Armed Forces Medical Services.—Until the beginning of World War II, the armed forces of Canada had only one medical service, the Royal Canadian Army Medical Corps. The Royal Canadian Navy and Air Force then established their own services, but it has long been apparent that medical manpower in the services could be more economically used if some unification of the three services were achieved. Such integration has been under study since 1952. A measure of unification has been obtained, with the establishment of a Joint Services Medical Board responsible among other things for solving problems in the operation of the new triservice hospitals, known as Department of National Defense Hospitals, to be located in Halifax, Ottawa, and Kingston and affiliated to the local medical schools. The new board is also responsible for the medical general training center and for establishing a long-term program for selection, training, and employment of clinical specialists, nursing assistants, and technical medical personnel in all three services. The new national defense hospitals will be administered locally by the appropriate commander of armed forces and will be responsible for medical care of all three armed forces in the region. Medical staff will be provided by the three services.

INDIA

Mecamylamine for Hypertension.—Datey and Joshi (*Journal of the Indian Medical Association*, vol. 30, Jan. 16, 1958) studied the action of mecamylamine hydrochloride in eight patients with hypertension. The prognosis of malignant and severe nonmalignant hypertension has improved since the introduction of antihypertensive drugs, particularly the ganglion blocking agents. Some of the disadvantages of the older ganglion blocking agents such as hexamethonium and pentamethonium are believed to have been overcome by the introduction of mecamylamine, which is also a ganglion blocking agent. The patients studied were hospitalized during treatment. All had moderate to severe hypertension. The blood pressures ranged from 182/110 to 240/160 mm. Hg. All of the patients had received some antihypertensive drug before coming to the hospital, without any benefit. The drug was given in doses of 2.5 mg. twice a day and the dose was increased gradually till an optimal response was obtained. In some the dose had to be reduced, as there was an excessive hypotensive response even with the initial dose. The patients were kept on a low-salt diet.

The blood pressure came down in all patients. On an average there was a reduction of 46 mm. Hg in the systolic and of 20 mm. Hg in the diastolic pressure with the patient in the recumbent position and a reduction of 75 and 26 mm. Hg, respectively, with the patient standing. Postural hypotension was present in all patients. The action of the drug became evident within one-half to two hours of administration and reached its maximum in four to six hours. The action lasted for about 18 hours. Partial tolerance was found in two patients in whom the pressure started rising after an initial lowering. Electrocardiograms showed slight reversal of the left ventricular pattern and the T waves became either flattened or slightly positive. The voltage continued to be high. There was a return of grade 4 to grade 3 retinopathy in two patients. The usual side-reactions (as with the older blocking agents) such as dryness of mouth, gastrointestinal disturbances, palpitation, dilated pupils, fatigue, mental deterioration, and postural hypotension were also seen with this drug.

Hepatic Cirrhosis.—Kinare and Purandare (*Journal of Postgraduate Medicine*, vol. 4, January, 1958) studied autopsy reports of 250 cases of portal cirrhosis. From 1926 to 1954 there were 10,250 autopsies performed in the K. E. M. Hospital, Bombay. Of these, 322 showed cirrhosis of the liver, and 250 definitely had portal cirrhosis. The maximum number of cases had occurred in the age group 31 to 40 years but there were 63 cases even in the age group 21 to 30 years. Males accounted for 223 of the cases. Data regarding diet were lacking in most cases, and a definite history of intake of alcohol was obtained in only five. Definite clinical manifestations of hepatic disease were present in only 117 patients. The remaining 133 died of either accidental injuries or some acute disease such as pneumonia or meningitis, cirrhosis being only an incidental finding in these cases. The chief manifestations of hepatic disease in the first group of 117 patients were ascites, loss of appetite, edema of the ankles, generalized anasarca, hematemesis, jaundice, and coma. Ascites was found in 97 of these. The amount of peritoneal fluid varied from 500 to 5,000 ml. It was a transudate in 84 cases; in 7 it was serosanguinous; and in 6 it was turbid due to bacterial infection. In none of the patients was the portal venous pressure recorded, but signs of collateral circulation suggestive of portal hypertension were present in 48%. Plasma proteins were estimated in only five of the patients with ascites and revealed a hypoproteinemia with reversal of the albumin-globulin ratio. Edema of the ankles and legs was present in 62 of the 117 patients.

Jaundice was not a common finding; clinically it was present in 16%. It was severe in 4, with an icterus index of over 100 units, and mild in 16, with an icterus index varying between 7 and 50 units. As the icterus index was determined in only a few cases, mild icterus may have been missed clinically. Dilated veins at the lower end of the esophagus were found in 68 of the 250 patients. Enlargement of spleen was observed at autopsy in 193. Of those that did not have splenomegaly 65% showed early cirrhotic changes in the liver, in 28% the liver was in the stage of active cirrhosis, and in 7% the cirrhotic process was far advanced. Hepatomegaly was seen at autopsy in 44 of the 250 and of these 10 were associated with malignancy while 34 showed diffuse fatty infiltration. Liver function tests had been done in only a few cases. The Takata-Ara test was done in nine cases and was negative in four, even in the presence of an advanced cirrhosis. In one of the patients in whom it was negative the hippuric acid test was positive. Thymol turbidity and alkaline phosphatase tests were made on one patient in whom the former was positive and the latter within normal limits. The Kahn test performed in 32 cases was positive in 17. Histologically the cirrhotic changes were divided into early, active, and quiescent or late stages. The early stage seen in 61 cases was characterized by an appreciable increase in connective tissue. The bile ducts showed evidence of proliferation and the parenchymatous cells surrounding new connective tissue showed degenerative and necrotic changes. In every case connective tissue proliferation appeared to start in the portal area. In only 30 of these was the cirrhotic change associated with a diffuse fatty change. Macroscopically, the liver was enlarged and pale yellow in 22 cases. In the rest it was normal in size with a smooth or finely granular surface. In 55 of these cases cirrhosis was an accidental finding.

The active stage of portal cirrhosis was characterized by complete destruction of the lobular pattern. Some parenchymatous cells showed evidence of multiplication, the necrobiotic changes being less marked than in the early stage. The connective tissue was vascular and richly infiltrated with cells. The proliferative activity of the ducts was moderate; 169 cases were classed in this group and 55 of these showed evidence of fatty change. The liver was smaller in size in 122 of these 169 cases. The typical hobnail appearance was present in 105 of them. The liver was firm to feel and difficult to cut. In 14, in addition to the changes of portal cirrhosis, primary carcinoma was found. Enlarged liver associated with fatty change was found in 12 cases. The liver was also enlarged in 10 cases with primary carcinoma but in 25 it was normal in size and had a granular surface. The late stage was characterized by the presence of mature and abundant connective tissue with collagenous fibers. It was less vascular and showed few cells. An exaggerated pseudolobular pattern was seen, the normal lobular pattern being absent. The parenchymatous cells had a normal appearance, the proliferative activity of the bile ducts was minimal. This stage was seen in 20 patients and none of these showed a fatty change. All these livers were smaller in size and had the hobnail appearance. In 12 of the 20 patients, cirrhosis was an incidental finding. The cause of death in the latent group was infection in about 50% while 24 of these 133 died of accidental injuries. In the other group of 117 with clinical evidence of hepatic disease, infection accounted for death in 3 of the 6 cases in the early stage of the disease. In the active and late stages, hematemesis was responsible for 30 deaths. Respiratory infection caused death in 17. In 14, primary carcinoma had supervened. As diffuse fatty change was not a universal finding in the patients studied, the authors suggested that all cases of portal cirrhosis might not be due to nutritional deficiency and that the disease is probably caused by a combination of factors.

Experimental Rickets.—P. K. Dikshit and co-workers (*Indian Journal of Medical Research*, vol. 46, January, 1958) stated that starvation acts as a stimulus to calcification, even restoring the process where it has been interrupted as in rickets. It was shown by others that changes taking place in the rachitic epiphysial cartilage of the albino rat during healing caused by administration of vitamin D or citrate were essentially the same. Similar changes are initiated by starving rachitic rats for about 48 hours. The authors studied the mechanism of healing of rickets induced by starvation and compared the results with those obtained by giving vitamin D and citrate to animals with rickets. Young albino rats were fed on a rachitogenic diet for 21 days and then starved for periods up to 48 hours. Observations were made during this period on the healing of rickets, change in citrogenase activity, and the citrate and total phosphorus content of the epiphysial cartilage. The results confirmed the favorable effect of starvation in inducing calcification of the rachitic epiphysial cartilage. The earliest signs of healing were evident after 24 hours, and at 48 hours the rachitic epiphysial cartilage showed extensive mineralization. The cartilage citrate did not increase during starvation even up to 48 hours, although in experiments with administration of vitamin D, the cartilage citrate showed an appreciable increase within 24 hours, remained stationary up to 96 hours, and then rose again. It thus appears that healing due to starvation sets in without an increase in the citrate content of the epiphysial cartilage. The total phosphorus content of the epiphysial cartilage on the other hand, showed an increase both during starvation and vitamin D administration. The plasma citrate of rachitic rats increased markedly during starvation. It was greatly reduced in animals with rickets and was elevated after vitamin D was given.

Administration of citrates to rachitic rats induced healing with histochemical changes in the epiphysial cartilage similar to those observed on administration of vitamin D. It was therefore thought that an arrest or slowing of the formation of citrate in the epiphysial cartilage was in some way responsible for the failure of calcification. Calcification was resumed if citrate was made available from extraneous sources, but in vitamin-D-treated animals, citrate became available at the site owing not only to its increased synthesis by the epiphysial cartilage but also to the blood in which the citrate level increased, possibly on account of increased citrate synthesis in the liver under the influence of vitamin D. In starvation, healing of the rachitic lesions was accompanied by a marked rise in plasma citrate, although the cartilage did not show any rise in citrate. This might be due to the rate of utilization of the citrate brought to the site of blood being so high as to prevent its accumulation in the cartilage. Thus any procedure which would overcome the citrate block in carbohydrate mechanism at the epiphysial cartilage should restore calcification impaired by a deficiency of vitamin D. Disturbance in the carbohydrate mechanism in vitamin D deficiency should be between the pyruvate and citrate stages. The fact that such diverse mechanisms as starvation, administration of vitamin D, and giving citrate lead to similar changes in the rachitic cartilage suggests the possibility of a common pathway of action of these procedures.

Novobiocin in Experimental Cholera.—Dutta and Colah (*Journal of Postgraduate Medicine*, vol. 1, January, 1958) used novobiocin to kill Vibrio cholerae in vitro experiments carried out by a serial dilution method. The drug was also tested in experimental cholera using a lyophilized rabbit-passage strain of V. cholerae. The drug was vibriostatic and vibriocidal in concentrations of 5 mcg. per milliliter and 10 mcg. per milliliter, respectively, in a population of 10^6 Vibrio organisms per milliliter. Under identical conditions, chloramphenicol showed vibriostatic activity at a concentration of 2.5 mcg. per milliliter and vibriocidal effect at 5 mcg. per milliliter. Thus the effectiveness of both the substances was of the same order. When novobiocin was given eight hours after infection, it prevented all symptoms of the disease. When treatment was started 16 hours after infection, 12 of 14 rabbits survived. The two that died continued to pass watery stools and showed gross signs of cholera at autopsy. Treatment was started after the appearance of diarrhea in six rabbits, none of whom survived. Thus although the drug could save about 86% of the animals when it was started 16 hours after infection, it was of no use once diarrhea had set in. Owing to the difficulty in administration of repeated doses of fluid in the collapsed veins of rabbits suffering from cholera, no fluid replacement was possible. Therefore the effect of treatment when started 16 hours after infection was taken as the criterion for judging its efficacy. The results show that it might be worth a trial in clinical cases of cholera.

Nutritional Status of Expectant Mothers.—A. Dhillon and co-workers (*Licentiate*, vol. 7, January, 1958) studied the nutritional status of 75 expectant mothers in an area covered by the primary health center of Najafgarh. This center provides services in nutritional care through its maternal and child-care program. It covers 26 villages in an area of 78 square miles. The services are rendered by physicians through care in the clinic and by public health nurses through institutional and domiciliary care in the area. Expectant mothers in the fourth to ninth month of pregnancy were selected for study. Of these, 25 were in the second and 50 in the third trimester. Their ages ranged from 17 to 45 years. Their heights varied from 4 ft. 4 in. to 5 ft. 5 in. and their weight from 82 to 156 lb. There was no appreciable gain in weight among these 75 women during pregnancy as compared with 75 nonpregnant women from the area. They appeared well nourished and were actively engaged in the usual village life; 13 were primiparas. There was no history of complications such as bleeding or toxemia in any of them. Thirteen had hemoglobin values between 66 and 80%; 55 had values between 56 and 65%; and 7 had values between 41 and 55%. Blood pressure and urine were normal in all. Seventy-two were vegetarians. Protein, vitamins A and C, and calcium were deficient in most diets. Barring anemia, these mothers were not found to be suffering from any signs of toxemias of pregnancy.

Infectious Hepatitis.—N. P. Gupta and co-workers (*Journal of the Indian Medical Association*, vol. 30, Feb. 16, 1958) found a marked increase in the number of cases of infectious hepatitis admitted to the Lucknow Medical College Hospital in the 10-year period ending October, 1956, with 1949 and 1955 as the peak years. Although cases were met with the year round, the incidence was minimal in October, November, and December. From January onward large numbers of these patients were admitted till epidemic proportions were reached in April, May, and June. A total of 547 such patients were admitted to the hospital during the 10-year period. Most of them were between 18 and 35 years of age; 75% were men. The disease was uncommon in children under 10 and adults over 40. Only two were over 70. Most of them came because of jaundice. Fever was present in 40%. Signs and symptoms referrable to the central nervous system were found in 10%. The liver was enlarged and tender in 323 (59%) and the spleen was palpable in 28 (5%). Splenomegaly was seen mostly in chronic cases with an illness of six weeks' duration. Cholemia and unconsciousness were seen in 59, of whom 48 died; acute massive necrosis in 32, all of whom died; hemorrhage from various sources in 32; edema in 45; and ascites in 10.

Liver function tests were performed in most of the cases. The thymol turbidity test was more uniformly positive at the height of the disease than was the cephalin-cholesterol flocculation test. The quantity of bilirubin in circulation was not related to the presence of complications. Clinical cure could not be predicted from the severity of the disease as judged by liver function tests. Values for serum alkaline phosphatase ranged from 6 to 18 King and Armstrong units in most of the patients, the highest figures being found in two patients with cholemia (30 and 36 units respectively). Serum protein estimation in some showed an increase due to an increase in the globulin fraction. In 23 the globulin level was higher than that of albumin. Discrepancies between various liver function tests were noted in some cases. In this series 64 patients died, a mortality of 11.7%. The death rate was higher in pregnant women (60%), but it was the same in men and nonpregnant women (5.7%). Neonatal hazards in infants born of mothers with infectious hepatitis were common. In adults the mortality was lowest in the age group 21 to 30 years, the age group most affected. It was very high in infants up to 2 years of age and it was also high in adults over 40. Thirty-eight patients died within two weeks of the onset, but in most of the patients the disease was chronic. There was no correlation between the initial severity of the disease and the final outcome, but neurological manifestations were more common in patients with severe jaundice.

Abdominal Tuberculosis.—Berry and Bidwai (*Journal of the Association of Physicians of India*, vol. 6, January, 1958) reported that abdominal tuberculosis, not secondary to open pulmonary tuberculosis, is not so rare as was first thought and is, on the contrary, a definite and independent entity. In a series of 26 such patients, all were between 11 and 35 years of age except for one aged 18 months. In 12, such general symptoms as low-grade fever, anorexia, and loss of weight were present. In 13 of the 17 women, some type of menstrual disturbance (amenorrhea or profuse irregular periods) was noted. Abdominal pain and tenderness was the commonest abdominal symptom, being present in 19. Seven complained of distention, with visible peristalsis in two. In 7, free fluid was present and 13 had a palpable abdominal mass either diffuse or localized. The usual consistency was firm. Plain roentgenograms of three patients who had signs of subacute or acute intestinal obstruction showed multiple dilated loops of intestine with gas shadows and fluid levels. Barium enemas in 13 revealed evidence of intestinal stasis and partial obstruction such as delay in the passage of barium and dilated loops in 10. Extra-abdominal tuberculous lesions were found in 12. These included tuberculous pleural effusion, which was commonest, acute dry pleurisy, thickened pleura, concomitant pericarditis with or without effusion, disseminated hematogenous pulmonary shadows, and healed or active tuberculous sinuses in the neck. One patient developed tuberculous meningitis while under observation. The peritoneal and pleural fluids showed the characteristics of a lymphocytic exudate.

Laparotomy was performed on 15 patients. Of these, 13 had enlarged mesenteric glands and multiple adhesions with miliary tubercles. An ileocecal mass was present in three patients and the uterine adnexa were involved in two. Intra-abdominal biopsy specimens showed follicle formation with epithelioid cells and lymphocytes in 12, giant cell systems in 12, fibroblastic proliferation in 10, and caseation in 7. In only one was there a calcified nodule in a lymph node with no other feature suggestive of tuberculosis. Culture of pericardial, pleural, or peritoneal fluid or of the intra-abdominal biopsy specimens gave no evidence of tuberculosis. Prolonged follow-up of three patients showed development of tuberculosis lesions in other parts of the body. The initial response to antituberculosis drugs was good and to some degree may provide evidence in favor of a diagnosis of tuberculosis. Abdominal pain was the commonest symptom. Manifestations of low-grade toxemia were common, but their absence did not exclude the diagnosis of tuberculosis. Associated menstrual disturbances were common in the women. A palpable mass in the abdomen, visible peristalsis, and fluid in the abdomen were the common physical signs. Extra-abdominal tuberculous lesions may precede, accompany, or follow manifestations of abdominal tuberculosis, indicating hematogenous dissemination.

SWEDEN

Pregnancy After Legal Abortion.—Between Nov. 30, 1956, and Dec. 26, 1957, a total of 3,362 women were confined at a maternity hospital; 100 of them had a history of recent abortion induced legally. The indications were psychiatric or sociopsychiatric in 87, a somatic ailment in 8, eugenic (on account of the father) in 4, and humanitarian in 1. Dr. Per Arén (*Svenska läkartidningen,* Feb. 21, 1958) studied these 100 cases with a view to illuminating the motives leading to abortion. In this series, 48 had suffered in various degrees from a sense of guilt at the time of the abortion, and this had in 34 cases led to the subsequent pregnancy being uninterrupted. In no case had health been impaired by allowing the pregnancy to go to term, and this had happened within three years of the abortion in 70 cases. In 48, the pregnancy had been desired. In fully half the patients there had been some improvement of health or the general condition since the abortion.

The Sedimentation Rate in Pregnancy and After Abortion.—Dr. L. Nilsson (*Svenska läkartidningen,* Feb. 21, 1958) made histopathological examinations of the ova in cases of spontaneous or criminal abortion. Serving as controls were 200 women attending a maternity center and not presenting any evidence of a recent or present infection. He concluded that early in normal pregnancy the sedimentation rate is normal or slightly raised. It is the same during a spontaneous abortion as during a pregnancy which is allowed to continue. A greatly increased rate indicates some complication of an abortion. When it is criminal, the rate may be normal, but it is not infrequently raised. A raised rate after an early abortion suggests that it is criminal if there is nothing else to explain it.

Basal Temperature as a Pregnancy Test.—Dr. P. Bergman (*Nordisk medicin,* Jan. 30, 1958) studied a series of 164 pregnancies in 155 women. In most of these the measurements of the temperature were discontinued some months after pregnancy had started, but in six it was closely observed throughout pregnancy. The temperature elevation in he corpus luteum phase at the start of pregnancy was found to persist during the first three or four months of pregnancy, after which it fell successively to the preovulation level. Only two pregnancies, both in the same woman, failed to show the anticipated rise in temperature. In three other pregnancies the temperature readings were ambiguous. Otherwise the test gave the positive reactions expected of it. A rise of temperature due to an infection or some other morbid condition might conceivably obscure the issue, but the experience of the past 10 years has not provided a single case in which this happened, the fluctuating fever of an infection being easily distinguishable from the steady temperature level of the Friedman test. Bergman found that it permitted early diagnosis of pregnancy, comparable with the ordinary biological tests of pregnancy. It also made possible a prediction of the time of delivery. It may be particularly useful in patients with oligomenorrhea in which it is difficult to predict this time on the basis of the last menstruation. It is simple and inexpensive.

In Memory of Axel Munthe.—Last fall a tribute was paid to Dr. Axel Munthe, Swedish author of "The Story of San Michele," in a commemorative program sponsored by the Swedish Radio Service. One of the speakers on this occasion, Dr. Wolfram Kock, has elaborated what he said then in an article published in *Svenska läkartidningen* for Feb. 14. Munthe was only 23 years old when in 1880 he successfully defended his thesis for the degree of Doctor of Medicine at the University of Paris. In so doing, he became the youngest doctor in France to hold this title at the time. After returning to Sweden to marry, he settled in 1881 in Paris. His patients were recruited from the colonies of rich foreigners as well as from the poor of Paris. His interest in hypnotism drew him to the Salpêtrière Hospital where Charcot gave dramatic demonstrations for the benefit of an inquisitive and fashionable public. Munthe was interested enough in Charcot's teachings to apply them to his own treatment of hysteria and allied conditions with modifications suitable to the patient's mentality and his own tastes, but after a time he came to be more impressed by Charcot's arch enemy, Professor Bernheim of Nancy; and when an anonymous article in *Figaro* referred contemptuously to Charcot's theatrical displays, and Munthe was suspected as its author or inspirer, the doors of the Salpêtrière were forever barred to him. Munthe's account in "The Story of San Michele" of his last meeting with Charcot is dramatic enough to give the reader a hint as to the character of these two forceful personalities.

Audiologic Laboratory.—Since the fall of 1951, the Karolinska Hospital in Stockholm has housed the Child Audiologic Laboratory about which Dr. B. Barr wrote in *Svenska läkartidningen* for Feb. 14. The laboratory has five hospital beds at its disposal. Its patients are selected in such a way that its beds are not monopolized by patients who could be treated by local talent. Its waiting list of 6 to 12 months, unrelieved by similar enterprises elsewhere, is an indication of its usefulness and popularity. The children are admitted for one week but the period is sometimes extended. Close cooperation with the parents is one of the most important functions of the laboratory, requiring much time and care in view of the part played by the purely mental factor in many cases of deafness. Indeed, nearly half of the first 1,000 patients treated had normal peripheral hearing, the defective reaction to sounds or late development of speech being traceable to mental retardation or some emotional shock. Such patients often take more time and require more skilled examination than those with organic lesions of the hearing apparatus. The laboratory has started to receive patients less than 6 months old in response to a growing realization of the importance of treating the patient as early as possible.

UNITED KINGDOM

Television Medical Series.—A sharp controversy has been raging regarding the British Broadcasting Corporation's television series entitled "Your Life in Their Hands." While many physicians report unfavorable reactions among their patients, others have found the program interesting and helpful. The incidence of hypochondriasis may appear to be increased, but at a press conference one practitioner expressed the view that he would prefer additional perhaps unnecessary office calls to delayed consultation on more serious illness from fear or ignorance. There is evidence of high technical skill and first-class medical advice behind the execution of the programs. If there is less evidence of good judgment in the choice of subjects, the reason is to be found in the original object of the series, which is to show the regional medical facilities now available in the provinces. The B. B. C. arranged for each of its regions to produce one program, and within each region a suitable hospital was chosen. Presentation and choice of the subject matter was left to the hospitals concerned. They did their job magnificently, but though it was understood that one of the 10 programs would come from a cottage hospital, they have so far all been from specialist centers. This was the basis for the first controversial point.

The viewers got the impression that their lives were chiefly in the hands of specialists. The emphasis was on disease, and not very common disease at that. Many doctors wished it could have been less on comparative rarities in hospitals and more on the problems of the maintenance of general health and such everyday conditions as colds, rheumatism, and bronchitis. In launching this series the B. B. C. wished to promote a healthy interest in disease and was encouraged by the favorable audience research report of May, 1957, on the "Hurt Mind" series, which was supported by the National Association for Mental Health. In these the patients were masked and strictly anonymous and B. B. C. studio staff were used. The new series used "live" physicians, nurses, and patients, who would be expected to give a more realistic performance. This raised the second controversial point as to whether it were desirable for ill patients or their relatives to allow public examination of their physical condition and whether this could benefit the viewer. Whatever criticism is leveled one must admire the great skill with which the B. B. C. and the hospitals produced these programs and regret that the British Medical Association and the B. B. C., both acting with high motives, have taken diametrically opposite views with regard to the results.

The *British Medical Journals* of March 1 and 8 quote letters from several physicians describing the varied effects on their patients. One man, previously unaware of his condition, guessed correctly that he had cancer. A physician told the British Medical Association that as a result of the same program his patients had become jittery. One, with a benign swelling, became convinced it was malignant. An editorial stated: "Because the hospitals are now owned by the State, and therefore the owner, the Ministry of Health, can give a national broadcasting corporation permission to enter the public wards, does not justify the intervention of the television camera in the doctor-patient relationship, even though in the particular circumstance the two sides agree to it. For this reason what they are exhibiting on the television screens all over the country is not solely and simply Mrs. X's heart operation or Mr. Y's cirrhotic liver. They are by this means intervening in the doctor-patient relationship of other practising doctors. They are raising doubts and fears in the minds of their colleagues' patients, and already with one or two distressing, if not disastrous results, which we consider it is impossible to justify on the highly questionable grounds that the majority will benefit from knowing something about disease. . . . Let us hope that the B. B. C.'s present preoccupation with disease is a passing phase and not part of a policy that, if continued, will make Britons disease-conscious people."

Budgerigar and Poliomyelitis.—Sommerville and coworkers (*Lancet*, March 8, 1958) reported that a budgerigar that bit the lip of a boy who later died from poliomyelitis was found to have a poliovirus. Although numerous animals, including dogs, cats, and moles have been named as possible reservoirs of poliovirus, confirmatory evidence from the laboratory has always been lacking, but in this case there seems little doubt that the budgerigar was infected with poliovirus type 1. It had been in contact on Aug. 15, 1957, with the victim while it was recovering from paralysis of its legs. Another bird from the same cage had died from a similar attack of paralysis a few days earlier. The boy became ill on Aug. 22, developed signs of bulbar poliomyelitis on Aug. 24, and died four days later.

Postoperative Comfort.—In the *British Medical Journal* of Jan. 25, Dr. H. L. Marriott described from personal experience a recent cholecystectomy and an abdominal operation of some years earlier. This prompted the suggestion that the patient be nursed for parts of the first few postoperative days in an armchair leaning well forward on a pillow on a low table. In favor of this position there was reduction of pain as the wound was relaxed, breathing was easier, and coughing was also easier. If vomiting occurred there was less danger of aspiration, and, as it was the normal lavatory position, the passing of flatus was naturally accomplished. The tendency to bed sores was less because the area of distribution of pressure was greater, and the legs were more frequently moved than when sitting in bed. The effect on morale would also be favorable, but although the abdominal operation that Dr. Marriott underwent is usually associated with minimal discomfort, even this could have been largely eliminated by this position of sitting bent forward.

Surgeons Honored.—The Council of the Royal College of Surgeons announced that honorary fellowships were conferred, among others on Prof. Warren H. Cole, Professor of Surgery in the University of Illinois, and Dr. Charles W. Mayo, Professor of Surgery at the Mayo Foundation.

CORRESPONDENCE

NUTRITION IN THE SURGICAL PATIENT

To the Editor:—In an editorial in THE JOURNAL of Dec. 7, 1957, page 1830, entitled "Nutrition in the Surgical Patient," some statements are made which are disputable. The writer states that to maintain caloric equilibrium it is necessary to give 40 calories per kilogram to the average-sized individual. Thus, a male, aged 40, height 67 in. (170 cm.), weight 154 lb. (70 kg.), would have a daily expenditure of 2,800 calories. The basal caloric expenditure of such a patient is approximately 1,700 calories. Since physical activities are negligible postoperatively, the exogenous caloric output would barely reach 400 calories, making the total daily energy output 2,100 calories. Thus, only 30 calories, rather than 40, per kilogram are necessary to maintain caloric equilibrium.

The writer further states: "After a subtotal gastrectomy . . . male patients who were maintained solely on sugar solutions during the postoperative period showed a five-day cumulative nitrogen deficit of about 60 Gm. and lost about 0.5 kg. (1 lb.) of body weight per day." He then stresses the fundamental necessity of maintaining nitrogen and caloric equilibrium and describes methods of doing so by intravenous alimentation and other means. In reference to these two points, namely, weight and nitrogen equilibrium, the following comments may be made.

First, the weight loss occurring in these patients is entirely different in nature from that occurring in clinical weight reduction. Cognizance of the following facts is essential. While fat can be stored in an almost pure state in the body, protein cannot be stored dry but retains with it three or more parts of water. Thus, 1 Gm. of adipose tissue has a value of approximately 8 calories, while 1 Gm. of flesh has approximately a value of 1 calorie. In clinical weight reduction, the patient is in nitrogen equilibrium, and the caloric deficit is made up by the catabolism of fat. The caloric equivalent of 1 lb. of body weight lost is about 3,500 calories. The negative nitrogen balance of 60 Gm. in the gastrectomized patients indicates a loss of 360 Gm. of protein, which when added to the 1,080 Gm. (2.4 lb.) of water stored with the protein represents a total loss of 3.2 lb. of body weight. The caloric equivalent of these 3.2 lb. lost is only 1,440 calories. Thus, of the 5 lb. lost by the patient in five days, at least half was water.

Second, the writer stresses the fundamental necessity of using every means to obtain nitrogen equilibrium. The professional faster, Levanzin (Benedict, A Study of Prolonged Fasting, publication 203, Carnegie Institution of Washington, 1915), fasted for 31 days, during which time he lost 18.3 lb. (8.3 kg.) of flesh, without any appreciable detriment to health. The patients described by the writer lost 60 Gm. of nitrogen, which is equivalent to a loss of 3.2 lb. of flesh. The loss of this amount of flesh in an adult whose lean body mass is normal or above normal does not at all adversely affect the physiology of the body. During the period of rehabilitation, the depleted protein stores are rapidly replenished. Thus, the attempt to prevent a negative nitrogen balance in these patients may be considered optional but not essential. These means are essential only in those individuals where the lean body mass is below normal.

I am in full agreement with the writer that the metabolism of carbohydrate (dextrose), water, electrolytes (sodium, potassium, and chloride), and vitamins must be kept in equilibrium.

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THYROID STABILITY

To the Editor:—In their communication in the Jan. 25, 1958, issue of THE JOURNAL, page 401, Drs. J. A. Hubata, P. J. McCall, and T. Douglass of Armour's Laboratories disagree with my contention on thyroid stability as stated in my article on "Hypothyroidism" (*J. A. M. A.* 165:121 [Sept. 14] 1957).

No attempt was made to present laboratory data based on rat and mice experiments in this paper, although such a study was made in conjunction with the Armour Company with predecessors of Doctor Hubata et al. Rather, my conclusions were based on a 2-year clinical study under the late Doctor Henry S. Plummer at the Mayo Clinic and a 35-year study at the Jackson Clinic. This is a subject in which I feel a comparison cannot be made between the results obtained in mice and men. In some drugstores and in some doctors' offices, bottles of thyroid are opened and may stand on shelves for months or years. As stated in my article, seldom has more than two grains of thyroid been required to control hypothyroidism, providing the drug was not impotent.

As Doctor Hubata et al. stated, "the officially required U. S. P. XV assay of sodium thiosulfate-starch titration to determine the iodine content of thyroid preparations is accurate . . . as is the biological method employed for this study based upon the ability of thyroid substance to inhibit the hypertrophic activity of thiouracil (n-propylthiouracil) in rats." Yet laboratory results in rats and clinical results in man are not always in accord, and there may be some other factor to account for the difference in our deductions. I should like to reiterate that the Armour thyroid that I have prescribed has always given satisfactory results.

In his communication to THE JOURNAL (166:401, Jan. 25, 1958), Dr. Paul L. Wermer, Vice-President and Medical Director, Warner-Chilcott Laboratories, gives the answer to his own statement concerning my article on "Hypothyroidism," which appeared in the Sept. 14, 1957, issue of THE JOURNAL. "His reference was to desiccated thyroid tablets; . . . we should like to take issue with this statement at least so far as it applies to our product." No mention of their product was made in my article since I have had no personal experience with it.

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THYROID STABILITY

To the Editor:—In the article on "Hypothyroidism" by Dr. A. S. Jackson (*J. A. M. A.* **165:121** [Sept. 14] 1957), the statements were made that "thyroid tablets lost their potency if they were more than three months old" and "This observation was later found to be true in many other cases." Since then, two different communications in THE JOURNAL (166:401 [Jan. 25] 1958) have taken issue with Dr. Jackson's findings concerning the stability of biological activity in thyroid preparations. Data from our control laboratory are likewise in disagreement with Dr. Jackson's findings, since they demonstrate the stability of commercial thyroid preparations.

Biological Activity of Thyroid Tablets and Capsules (Wilson)

Lot No.	Thyroid Preparation	Year Mfd.	Age of Sample at Time of Assay (Jan., 1958) Years	Biological Activity,* % of Wilson Standard (Thyroid Powder U.S.P. Lot No. 103086)
99316	2 grain uncoated (tablets)	1956	1.5	139±19
95457	5 grain (capsules)	1956	2.0	83±27
90577	1 grain uncoated (tablets)	1954	3.5	81±22
70265	2 grain coated (tablets)	1947	10.5	125±23

* Biological activity was determined by antigoitrogenic effect in thiouracil-fed rats. The tablets were ground, incorporated in the thiouracil-containing diet, and fed ad libitum. All assays were performed at 2 to 3 dose levels. The reference standard used was a U.S.P. thyroid powder manufactured in November, 1957, and which had been standardized against the previous house standard. The iodine content of the standard powder and the powders used for the manufacture of the tablets was 0.2 ± 0.03%.

Biological activity of thyroid tablets and capsules stored for various periods at room temperature is shown in the tabl

From the data presented here and other studies in our files we cannot agree with Dr. Jackson's findings. Our data show that thyroid tablets (uncoated) retain their biological activity for a period of at least 3½ years, while coated tablets retain activity for over 10 years.

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LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Use of Oscilloclast as Fraud in Practice of Medicine.—The defendant was prosecuted for theft in the practice of medicine and from a conviction appealed to the district court of appeal, second district, division 3, California. When patients went to the office of the defendant chiropractor, he would take a sample of their blood and send it to his codefendant, an osteopath, for analysis by means of a radioscope. The radioscope used by the osteopath is a black box containing two electrical circuits, dials, switches, a variable condenser, an electrode or trap door, and some attachments. The radioscope was apparently invented by the late Doctor Albert Abrams, who was the founder of the electronic school of medicine. Abrams thought that disease is a lack of harmony in the electronic oscillations of the human body and that diseased tissue gives off a rate of vibration. Followers of Doctor Abrams use the radioscope to measure the vibratory rate of electromagnetic energy in different parts of the human system.

In using the radioscope, the osteopath was helped by an assistant, a Mrs. Ogle. The osteopath first unwrapped a blood sample from its tinfoil container and placed it in the trap door of the machine, which she then closed. Next she clipped one of the attachments to the side of Mrs. Ogle, who stood in front of the machine with her abdomen exposed. Mrs. Ogle held another attachment in her hand and touched it to various parts of her body as directed by the osteopath. Meanwhile, the osteopath took a glass wand or conductor and stroked it across the left side of Mrs. Ogle's bare abdomen. While stroking the wand, the osteopath turned the dials on the machine and made notations of the vibratory rates of electromagnetic energy indicated by the machine as Mrs. Ogle touched the attachment to different parts of her body. After deteran "Atlas" prepared by a Doctor Colson, which correlated the rates of vibration with particular kinds of disease energy. Then she prepared a treatment chart, which she sent to the defendant; this chart stated the nature of the patient's illness and gave directions as to the particular part of the patient's body to be treated with the oscilloclast.

When the report was returned, the defendant would then tell the patient that he or she had cancer, tuberculosis, liver trouble, or a number of other conditions and would assure him that such a condition could be cured by a series of treatments with an oscilloclast. These treatments would then be continued for varying lengths of time, and for a fee.

The oscilloclast used by the defendant is a kind of vibrator. It is a black box, containing two circuits, one of which is electronic and the other electric. It also has a number of dials and attachments. The electric circuit carries a 60-cycle alternating current, while the electronic circuit is composed of two vacuum tubes; one tube is connected to an oscillator which resonates at about 40 megacycles and the other tube acts as a switch, turning the power on and off at a rate of 90 times a minute. In theory, the oscilloclast dissipates disease energy by eradicating the electrical impulses emitted by the disease. Thus when treatments with the machine are given, the attachments are placed against those parts of the patient's body which are affected by the disease, and the dials are adjusted so as to transmit the precise rate of energy which, according to Colson's "Atlas," will counteract the disease.

A number of experts testifying on behalf of the People gave their opinions as to the scientific value of these two devices. One, a nuclear physicist, said that the radioclast would not measure any electromagnetic energy emitted by a piece of dried blood for the reason that the radioscope is a closed circuit. Furthermore, he said that the power generated by the oscilloclast is so minimal that the machine would have no more effect than a vigorous rubbing of the skin. And a physician who specialized in the treatment of cancer said that long-wave radiation, as used in the oscilloclast, cannot destroy cancer cells or have any effect on cancer.

On the basis of the above and all the other evidence in the case, the jury was of the opinion that the defendant was in effect guilty of a fraud on his patients when he used such a device as the oscilloclast and when he held out to them that he could cure cancer and other diseases with such a device. The court of appeals agreed with the findings of the jury and affirmed the judgment holding the defendant guilty of theft in the treatment of patients for cancer, tuberculosis, and other illness with an oscilloclast. *People v. Schmidt,* 317 P(2) 673, (Calif., 1957).

THE LEISURE CORNER

A PRIMER ON CAMERAS

The truth of the ancient Chinese proverb that "one picture is worth more than ten thousand words" has at no time been more apparent than today, as Americans click away with over 60 million cameras.

Photography has been called photogenic drawing, the pencil of nature, sun painting, sun pictures, and shadow catching—all variants from the Greek "drawing with light."

But photography is not only drawing with light—it is modeling or sculpturing with light; it is painting with light on film as artists through the ages have painted with brush on canvas. Physician artists have been noted for accurate delineations of the anatomy: Richard Bright, Harvey Cushing, E. L. Trudeau, Frank Netter, to name a few.

The camera has widened the field of art. Today more and more physicians, who have been, in their comparatively little free time, "Sunday painters," are turning to the photographic form of art. This year, the 20th annual exhibition of the American Physicians Art Association, which was held in January at the Academy of Medicine in New York, included an impressive number of photographic entries.

You may be one of the many who have thought that some day you would like to fool around with a camera, but have not known just where to start. Actually you most likely will not be able to decide which camera is best suited to your particular interest until you have experimented awhile. The type of photography you want to do will inevitably lead you to the camera that will be just right for you.

The all-important question is what kind of photographs would you be most interested in making? Will you be satisfied with snapshots made with a simple, inexpensive box camera? Do you aim no further than at slightly more difficult interiors and portraits? Are you interested in views of scenic grandeur, or must your photos also live and breathe? Will you be content to take a shot and then wait to use up another dozen or two dozen exposures to see what you have captured on film, or do you want to see what you have taken immediately after you have snapped the picture? Is photography to be a means of self-expression with a never-ending canvas on which you can depict landscapes, still life, a carefree day in the country or a study of the city streets? Do you want your photographs to be formal or candid? These are the considerations that will dictate your choice, or choices, of a camera, because you may find that eventually you will want more than one camera. Let's take a look at the types of cameras on the market to get an over-all picture.

Box Camera.—This type of camera is very simple in construction and is held at waist-level for viewing. It includes a lightproof body of metal or plastic, a simple lens with an opening of f/11 or f/16, a self-setting shutter fixed at 1/25 second, a film-advance mechanism, a colored window to show the film exposure number, and usually two window and mirror viewfinders—one for horizontal and one for vertical exposures. (Focal [f] numbers are used to designate the light-gathering power of a lens at various diaphragm openings. For instance, an f/11 lens can gather more light in a given interval than f/16 lens and is therefore faster. The larger the focal number, the smaller the light intensity.)

Even the simplest cameras have internal flash synchronization and can be used for making flash snapshots indoors or at night. Most models are equipped with a setting which allows you to keep the shutter open for prolonged exposures. However, the fixed lens and slow shutter speed make it impossible to take action shots. Because of the inexpensive lens, negatives will not be sharp enough for extreme enlargement.

Box cameras are nonadjustable—they do not have focusing or exposure controls. You just load it with film, aim, and press the button—your photo finisher does the rest. All box cameras use roll film, and you can get from 6 to 16 pictures on a roll, depending on the size of film.

Simple Reflex Camera.—Another box-type camera is the simple reflex camera which differs from the regular box camera chiefly in that it has a large viewfinder window above the lens and a big, bright viewing screen in the top of the camera which makes it easier to compose the picture and see exactly what you are getting on film in the size of the finished print. Roll film is used and will make 12 2¼-by-2¼-in. negatives.

Like the box camera, simple reflex cameras usually have flash synchronization, and shutter settings for relatively fast or prolonged shots. These cameras often have additional features not found on the simple box camera: a sliding front panel which protects the lens when the camera is not in use, a built-in close-up lens, and a device to prevent double exposure.

Simple Folding Camera.—This type of camera equipped with a lens and a shutter similar to that of the box camera folds flat on accordion-like bellows when not in use. This protects the lens and makes the camera more compact for carrying, otherwise there is really no advantage over the box type, except that there may be more than one lens opening rather than a fixed focus. From 12 to 16 negatives can be obtained on one roll of film.

Adjustable Folding Camera.—The adjustable folding camera has faster adjustable lenses that permit picture taking with less light, and faster shutters to stop action which is beyond the scope of the simple camera.

Because this camera is much more intricate and versatile the price range varies widely, depending on the lens and shutter. For instance, cameras in the medium-price range have lenses of from f/6.3 to f/3.5 and shutter speeds as fast as 1/100 or 1/200 second. In the higher price brackets cameras are equipped with fast precision lenses and have shutter speeds as high as 1/800 second, and include refinements such as a coupled range finder for better focusing. This type of camera uses a variety of film sizes—from 8 2¼-by-4¼-in. to 16 2¼-by-1⅝-in. exposures.

Twin-Lens Reflex.—The twin-lens reflex is actually two cameras in one: a viewing camera on top of a taking camera. It is equipped with two lenses mounted in a rigid lens board. The lenses move in and out in unison when the focusing control is adjusted. The viewing-lens image is reflected by a mirror to a ground-glass viewing screen on top of the camera. It is comparatively easy to focus by adjusting the focusing knob until the image looks sharp on the ground glass.

Primarily designed for waist-level viewing, some twin-lens reflexes have provisions for eye-level viewing. High-quality lenses with openings of up to f/2.8 are available. Shutter speeds go as high as 1/500 second on the more expensive models. Most are flash-synchronized, and take 12 2¼-by-2¼-in. pictures on a roll of 120 or 620 film.

Because focusing and viewfinding are so easy with these cameras they are good for beginners, even though the higher-priced models are used by many professionals for picture taking under difficult conditions.

Thirty-five-Millimeter Cameras.—The 35-mm. cameras have many advantages: they are compact and easy to carry; they are equipped with fast shutters and lenses; they hold large film loads of 20 to 36 exposures; and they are convenient for color photography. The more expensive types have interchangeable lenses for telescopic or other special effects. The disadvantages of a 35-mm. camera are that the small negative size requires careful handling and the large film loads can be a nuisance if one wishes to take only a few pictures and see results quickly.

Most 35-mm. cameras, except the less expensive makes, are equipped with coupled range finders, automatic film-advance and shutter-cocking mechanisms. Prices vary greatly, depending on lens and shutter. A typical medium-priced make has an f/3.5 lens and a shutter with speeds up to 1/200 second. The most expensive have lenses of f/1.4 or f/1.5

and shutter speeds up to 1/1,200 second. Wide-angle or telephoto lenses are also available for special purposes.

Polaroid Land Cameras.—The Polaroid Land cameras have introduced "picture-in-a-minute" photography, with the tremendous advantage of giving results immediately. This eliminates the rather common experience in conventional photography of discovering later that you do not have the picture you want, an especially sad situation when the pictures missed are vacation shots or family gatherings which cannot be retaken.

And for the busy professional man, pictures-on-the-spot have another tremendous advantage in the learning stage. The time needed to upgrade yourself from a rank beginner to a skilled amateur can be greatly shortened by using Land cameras and correcting your personal mistakes as you go. Take the matter of filters, for example. They improve most outdoor pictures, but many amateurs never get around to mastering them. Why? Normally, when the beginner tries to acquaint himself with filters he finds that by the time the roll is finished and finally processed, he has forgotten the exposure techniques that gave him his best pictures. But when he sets up his Polaroid camera and shoots several pictures of the same scene, varying exposure times after he sees each picture, he quickly learns how to get the best results from any particular filter. This same see-as-you-go learning speeds all phases of photographic education—flash technique, close-ups, even posing people for ordinary snapshots.

Although Land photography is barely 10 years old, there have been so many improvements in both cameras and films that the needs of any photographer now can be satisfied with the current product line. There are relatively inexpensive cameras which require only a single setting for both lens openings and shutter speed—you simply read a number on the meter and set this same number on the camera. In the medium-priced range are two other cameras which have rangefinders, electronic flash connections, and other accessories.

Stereo Cameras.—The Stereo camera evokes memories of afternoons at Grandma's, with the stereopticon sessions and hot chocolate with cookies. This three-dimensional photography, in color now, is used for very special occasions and is effective with scenic subjects.

The camera is equipped with two matched lenses which take pictures at the same time, each from a slightly different viewpoint just as our eyes see a scene. After processing, the twin pictures are placed in special stereoscopic mounts for viewing or projection; the two slightly displaced versions of the scene are superimposed on each other in the viewer's brain and the result is a true stereoscopic picture, including all the roundness, solidity, and three-dimensional quality of life.

Most stereo cameras use 35-mm. film, which usually takes 16 stereo pairs on a 20-exposure load and 29 pairs on a 36-exposure roll. The camera has limited appeal because the matched lenses and shutters increase the cost, and the use of the camera is limited to those subjects which are peculiarly appropriate for stereoscopic pictures. Also, the pictures must be placed in a viewer or projected; they cannot be viewed otherwise.

Additional information about any of these types of cameras can be obtained from a variety of sources. Many magazines are devoted solely to photography and many volumes have been written about photography as a hobby and as a moneymaking venture. In fact, entire books, such as "Rollei Photography," "The Twin-Lens Camera Companion," "Leica Manual," "Pictures-in-a-Minute," and "35-mm. Technique," have been devoted to each type of camera.

When you select the camera you are most interested in, write to the manufacturer for full descriptive literature, or see your local photography dealer. Once you buy a camera, use it and join the happy family of physician shutterbugs.

MEDICAL FILM REVIEWS

The Effect of Solutions of Different Electrolyte Content on Living Cells: 16 mm., color, silent, showing time 19 minutes. Prepared in 1956 by George E. Shambaugh Jr., M.D., Chicago. Procurable on loan or purchase from Northwestern University Medical School, Department of Visual Education, 303 East Chicago Ave., Chicago 11.

This film provides an excellent visual demonstration of an old physiological axiom, namely, that living cells, in order to grow and remain functional, must be maintained in an ideal environment. By excellent microcinematography, the effects of various electrolyte solutions and frank injurious agents are demonstrated on several tissues growing in tissue culture. Thus, it is shown that isotonic sodium chloride solution, when perfusing such tissues as skin, cochlear epithelium, and middle ear epithelium growing in tissue culture, has a definite injurious effect. This injury is shown by cessation of cytoplasmic activity and disruption of structural integrity. Ringer's solution has a similar but less pronounced effect. The tissues are maintained best from a structural and functional viewpoint by Gey's balanced salt solution. The film would be best appreciated by those familiar with these techniques and thus able to recognize and interpret the subtle evidences of toxicity as demonstrated visually. The value of the film could be extended by use of longer and more detailed explanatory titles or by addition of a sound track.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

The Shock Syndrome Associated with Bacteremia Due to Gram-Negative Bacilli. M. H. Weil and W. W. Spink. A. M. A. Arch. Int. Med. 101:184-193 (Feb.) 1958 [Chicago].

The authors studied the clinical features of 400 patients who were hospitalized at the University of Minnesota Hospitals between January, 1950, and September, 1955, and from whose blood gram-negative enteric bacteria were recovered. There was no reasonable doubt that bacteremia was present in 278 of these patients; in 43 patients it was complicated by hypotension and the manifestations of shock. In 40 of the 43 patients with shock, a procedure performed in the hospital was implicated. This included instrumentation of the lower urinary passages in 20 patients, septic complications of abdominal, perineal, and pelvic surgical interventions in 13 patients, cannulation of a peripheral vein and intravenous administration of fluids under unfavorable conditions of sterility in 6 patients, and paracentesis in 1 patient. Signs of sepsis, including chills and fever, followed within 48 hours of the causative event, and shock appeared about 12 hours later. Nausea, vomiting, and diarrhea usually accompanied the onset of shock. The leukocyte count and the percentage of neutrophils were notably increased. Most patients had significant electrocardiographic abnormalities, which in many instances made differentiation from shock caused by myocardial infarction difficult. It is important to obtain a blood culture in patients in whom the cause of shock is not apparent. This is of value not only for the establishment of a specific diagnosis but also for planning optimal antibiotic therapy.

Twenty-eight of the 43 patients with shock died, a mortality rate of 65%, with death occurring at an average of 2.7 days after onset of shock. The mean duration of the state of shock for the 15 survivors was 6 days (12 hours to 26 days), indicating the protracted course of this type of shock. Acute renal failure may become a limiting factor during the recovery period and was the cause of death in 4 patients. The prompt use and judicious choice of antibiotics are most important aspects of therapy. Vasopressor agents and especially metaraminol probably promote reversibility of the circulatory disturbance and provide effective elevation of the blood pressure. Adrenal cortical hormones suppress the manifestations of toxemia caused by overwhelming infection and may be used to provide a period of grace during which infection and shock can be controlled.

Aortic Stenosis. L. Dexter, D. E. Harken, L. A. Cobb Jr. and others. A. M. A. Arch. Int. Med. 101:254-266 (Feb.) 1958 [Chicago].

The authors report on 9 men and 4 women, between the ages of 39 and 66 years, with pure aortic stenosis who were studied clinically and hemodynamically by catheterizing the left side of the heart. In this study, the critical cross-sectional area of the aortic valve was about 25% of the normal size, specifically about 0.6 sq. cm. or less (normal size, 2.6 to 3.5 sq. cm.). The cardiac output in aortic stenosis was almost uniformly normal or higher than normal, even in the face of a high left ventricular end-diastolic pressure, i. e., left ventricular failure. The reason is not readily apparent. This is in striking contrast to other central obstructions such as mitral stenosis, in which the cardiac output is almost uniformly reduced. The main consequence of aortic stenosis was left ventricular systolic hypertension. The highest systolic pressure recorded was 320 mm. Hg. In these symptomatic patients the average left ventricular minute work load was about twice normal, and in 1 patient it was about 6 times normal. This enormous work performance was possible through the medium of left ventricular hypertrophy, but this study did not reveal at what point in the course of aortic stenosis left ventricular hypertrophy was revealed by the electrocardiogram. All but 1 patient with a cross-sectional area of the aortic valve of 0.7 sq. cm. or less had left ventricular hypertrophy electrocardiographically. Eventually, left ventricular failure occurred, as indicated by a rise of left ventricular end-diastolic pressure.

Since severe aortic stenosis occurs characteristically in the older age group, when coronary disease is common, it was often impossible to decide clinically whether anginal pain was due mainly to coronary disease or to aortic stenosis. Only if severe

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aortic stenosis were detected by catheterization of the left side of the heart or if electrocardiographic evidence of myocardial infarction were present, could a decision be properly made. To increase the difficulty, however, considerable coronary disease and aortic stenosis may coexist. Anginal pain associated with less severe aortic stenosis was considered to be produced by the coexisting coronary artery disease. In 1 patient with coronary artery disease but only mild aortic stenosis, the clinical picture resembled that of severe aortic stenosis in that anginal pain, syncopal attacks, and left ventricular failure were present. Aortic stenosis often produced little roentgenologic evidence of left ventricular enlargement, even when the left ventricular systolic pressures were high, because hypertrophy is poorly reflected roentgenologically. Even with left ventricular failure, as indicated by a high end-diastolic pressure, there was often little left ventricular enlargement revealed by the chest roentgenogram, presumably because of the relative lack of distensibility of the heavily hypertrophied muscle. Aortic stenosis produced little, if any, enlargement of the left atrium, even when there was left ventricular failure with increase of the left atrial pressure.

There was a poor correlation between the severity of aortic stenosis and the pulse pressure, duration of the brachial arterial systolic upstroke, and anacrotism. Although a plateau pulse of the carotid artery was found almost uniformly at the advanced stage under study, it was absent in 1 patient with severe stenosis and it was present in 1 patient with mild stenosis. The evaluation of the severity of aortic stenosis before the advent of syncope, anginal pain, or left ventricular failure has, therefore, not been found easy by clinical methods, except by the use of catheterization of the left side of the heart. With the use of this technique, both pressure and flow must be measured in order to ascertain the size of the orifice of the aortic valve, either measurement alone being potentially misleading in its assessment. With knowledge of the flow and the pressure difference across the aortic valve, the cross-sectional area of the aortic valve was found to be calculable by the Gorlin formula with a high degree of accuracy.

Transmission of the Common Cold to Volunteers Under Controlled Conditions: I. The Common Cold as a Clinical Entity. G. G. Jackson, H. F. Dowling, I. G. Spiesman and A. V. Boand. A. M. A. Arch. Int. Med. **101**:267-278 (Feb.) 1958 [Chicago].

More than 1,000 young volunteers, most of them students between the ages of 20 and 25 years in schools of medicine, dentistry, or nursing, submitted to nasal instillation of dilute, cell-free, nasal secretion from donors with a common cold. Some secretions were stored for more than 1 year without loss of infectivity. Suitable criteria for the recognition of the presence of an experimental cold were developed. Findings showed that experimental colds developed in about 35 to 40% of the volunteers after a single challenge with an infectious secretion. Neither sex, season, nor the source of the different secretions significantly altered the susceptibility to an experimental challenge. The incubation period varied from 24 hours or less to 72 hours and was different for secretions collected from different donors and in different years. Headache, sneezing, chilliness, and sore throat were early symptoms of infection. Nasal discharge, nasal obstruction, cough, and malaise followed the onset by about 48 hours and were the severest symptoms. Nasopharyngeal examination was of no value in the identification of infected persons. The experimental cold was rarely associated with fever, and some of the persons experimented on showed a transient depression of the oral temperature during the early stages of the cold. The bacteriological flora of the nose and throat neither predisposed to, prevented, nor complicated experimental infection.

Thyroid Function and the Metabolism of Iodine in Patients with Subacute Thyroiditis. S. H. Ingbar and N. Freinkel. A. M. A. Arch. Int. Med. **101**:339-346 (Feb.) 1958 [Chicago].

The authors studied thyroid function and the metabolism of iodine before and after treatment in 8 women and 2 men, between the ages of 34 and 76 years, with subacute thyroiditis. Eight of the 10 patients were given external irradiation to the thyroid area. The irradiation dose varied between 500 and 850 r, measured in air. One patient was given cortisone intramuscularly. Another received 10 units of thyroid-stimulating hormone for 3 days. These therapeutic regimens were followed by remission of symptoms. Radioactive iodine studies were repeated within 2 to 4 weeks after restoration of an apparently normal state. In the 7 patients in whom measurements were made of serum precipitable stable iodine (PBI^{127}) in blood drawn at the time the radioiodine studies were performed, values for PBI^{127} before treatment ranged broadly between 2.7 mcg. and 16.2 mcg. per 100 cc. After treatment, normal values for PBI^{127} were found in all patients. Twenty-four-hour thyroidal uptakes of radioiodine (I^{131}) were negligible or markedly diminished in all 10 patients before treatment. After therapy, values for the thyroidal uptake of I^{131} were normal in all patients except 1 whose uptake after treatment was only 10%; this patient had noted an amelioration of symptoms coincident with the administration of thyroid-stimulating hormone. Normally, during the period between 24 and 72 hours after the administration of radioiodine the concentration of butanol-extractable I^{131} (BEI^{131}) in the serum increases, while in all patients with subacute thyroiditis values for BEI ^{131} were greater at 24 hours than at 72 hours. Concentrations of BEI ^{131} were entirely normal in 6 of 8 patients after treatment by irradiation. In all patients given irradiation, the normal quantitative relationship between 24-hour and 72-hour values was found. This relationship was also normal in the patient who had been treated with cortisone, but absolute values for BEI ^{131} after therapy were in the distinctly hyperthyroid range. The patient whose improvement was concomitant with the administration of thyroid-stimulating hormone continued to show an inversion of the usual relationship between 24-hour and 72-hour values for BEI ^{131}, and the 24-hour values were in the distinctly hyperthyroid range.

These findings suggest that during subacute thyroiditis 2 principal abnormalities in thyroid function occur. The first is a diminution, although not a complete cessation, of hormonal biosynthesis. The second is a loss of the storage function of the gland, with passage into the circulation of a variety of iodinated materials. These functional abnormalities have been shown to be promptly restored to normal after x-ray therapy. Although cortisone has proved remarkably effective in controlling the symptoms of acute thyroiditis, comparable demonstration of its ability to restore thyroidal function to normal has not been reported.

Course and Prognosis in Rheumatoid Arthritis. J. J. R. Duthie, P. W. Brown, J. D. E. Knox and M. Thompson. Ann. Rheumat. Dis. 16:411-424 (Dec.) 1957 [London].

Further studies of rheumatoid arthritis have been made in a group of patients first reported on in 1955. At that time the mean duration of follow-up was 24.4 months. It was concluded that improvement after treatment in hospital was reasonably well maintained in the majority of patients if medical and social supervision were adequate. The original group consisted of 307 patients. At the third and most recent assessment, nearly 6 years (67.4 months) after discharge from hospital, 247 of the original group remained available; 36 had died since discharge; 17 had left Scotland; and 7 had defaulted. Twenty-four per cent of the 247 patients were able to carry on all normal activities; 40% were moderately incapacitated; 26% were more severely crippled; and only 10% had become helpless and dependent on others. There had been remarkably little change in the distribution of patients, according to the four grades of functional capacity, between the first assessment made 2 years after discharge and the last assessment nearly 4 years later. The disease remained moderately active throughout the period of study in about 65% of the patients, but the proportion rated as active had decreased. At the third assessment nearly 30% showed no signs of activity. Of the patients considered eligible for remunerative employment on discharge from hospital, 39% were engaged in normal employment and 38% in light work at the time of the third assessment. Sixty per cent of the housewives were able to do all, or all but the heaviest, tasks in the home.

Patients admitted within 1 year of the onset had a substantially better prognosis than those admitted at a later stage. The prognosis in males was distinctly better than it was in females. Patients whose disease had run a rapidly progressive course without remission up to the time of admission did remarkably well. These patients had all been admitted within the first year, indicating the acuteness of their symptoms. They showed a significant advantage, both in terms of reduction of disease activity and improvement in functional capacity, over other patients admitted in the first year. Patients in grade 2 on admission had a better prognosis than those with more marked impairment of function. The grade of disease activity on admission gave little indication of future progress. The short duration of symptoms was of much greater significance in prognosis than the degree of activity on admission.

Functional capacity on discharge provided a reasonably reliable guide to prognosis. Those discharged in the 2 higher categories maintained their functional status reasonably well, whereas only a small proportion of those discharged in the lower 2 grades showed any improvement later on. Similarly, the subsequent course of the disease was less severe in patients assessed as inactive on discharge than in those in whom the disease was still active at this time. When the results of the sensitized sheep cell test, performed at the third assessment, were related to the course the disease had run since admission to hospital, it became clear that the group in whom the test was positive had suffered more severely than those giving a negative result. Age at onset, disease activity, functional capacity, erythrocyte sedimentation rate, and hemoglobin level on admission proved to be of little or no value in predicting the subsequent course of the disease. Treatment involving a certain degree of risk may justifiably be used if a potentially progressive and crippling form of the disease can be controlled or arrested at an early stage. Similar risks would not be acceptable for patients in whom the disease is destined to run a benign course.

Recurrence of Hemorrhage from Medically Treated Gastric Ulcers: Four-to-Eight-Year Follow-Up of Forty-Seven Patients. I. M. Arias, N. Zamcheck and W. B. Thrower. A. M. A. Arch. Int. Med. 101:369-376 (Feb.) 1958 [Chicago].

Thirty-one men and 19 women, between the ages of 26 and 86 years, with bleeding gastric ulcers were treated medically at the Boston City Hospital between 1948 and 1952. Forty-seven of the 50 patients were followed up 4 to 8 years after the bleeding episode. Nine of these patients had refused surgical intervention at the time of their initial hospitalization. Only 3 (6%) of the 47 patients had recurrent gastric ulcer hemorrhage during the follow-up period. This finding is in contrast to that of previous investigators who reported recurrence of hemorrhage from gastric ulcer in 16 to 33% of patients followed for 1 to 12 years. Symptoms of gastric ulcer recurred in 30 (64%) of the 47 patients. Complications of gastric ulcer, such as penetration, perforation, obstruction, or intractability, were observed in 6 patients. There were no cases of gastric carcinoma found at follow-up. The view that the hazard of recurrent hemorrhage makes surgery mandatory for all patients who have recovered from benign gastric ulcer hemorrhage is not supported by this study. This is particularly true in the older patients to whom gastrectomy is both painful and dangerous. Early roentgenologic examination and gastroscopy are necessary for satisfactory diagnosis of many gastric ulcers which may not be apparent when examination is delayed.

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Primary Carcinoma of the Liver in France: Observation on 25 Cases. J.-P. Benhamou and R. Fauvert. Semaine hôp. Paris 34:121-134 (Jan. 20) 1958 (In French) [Paris].

This study on primary cancer of the liver in France is based on the cases of 25 patients observed among 25,600 adult patients admitted to 3 public assistance medical services in Paris during the decade 1947-1956. In all patients the diagnosis of primary cancer was based on histological studies; in 22 patients it was confirmed at autopsy and in the other 3 by puncture biopsy. Twenty-three patients had hepatomas or hepatocholangiomas, and 2 had cholangiomas. In 19 of the 25 patients cirrhosis accompanied the cancer. In France primary cancer of the liver is found at 2.36% of autopsies, and it represents 10.83% of all cancers so discovered. This relatively high incidence of primary cancer of the liver is due to the frequency of alcoholic hepatic cirrhosis in France. Cirrhosis plays an important role in the etiology of primary hepatic cancer, for cancer is 14 times as frequent in patients with cirrhosis as it is in those without cirrhosis. It is estimated that 6.4% of hepatic cirrhoses become complicated by cancer, and it appears that malignant degeneration in the course of cirrhosis is more frequent now than it was formerly. This is attributed to the greater age now reached by patients with cirrhosis and to the slower progression of cirrhosis under the influence of present-day methods of treatment.

Primary cancer of the liver generally presents the symptoms of a severe cirrhosis, but the correct diagnosis is suggested by severe pains in the hypochondrium on the right, by pulmonary metastasis, and by acute, spontaneous hemoperitoneum. The biochemical aspects of primary cancer of the liver are similar to those of cirrhosis. Nevertheless, the discovery of alkaline hyperphosphatasemia or of hypoglycemia has some diagnostic value. The definite diagnosis of primary cancer of the liver is generally made only at autopsy. In the few cases in which the diagnosis was made before death, it was recognized from puncture biopsy or in the course of exploratory laparotomy. The therapeutic possibilities in cancer of the liver are extremely limited, chiefly owing to the fact that the lesion is usually extensive when discovered and because of the frequency of an associated cirrhosis. Surgical treatment is possible only in the rare cases in which the malignant tumor is limited to 1 lobe and in which cirrhosis is absent.

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Structural Aspects of Primary Epitheliomas of Liver in Man: A Study of 26 Cases Observed in France. L. Orcel. Semaine hôp. Paris 34:135-151 (Jan. 20) 1958 (In French) [Paris].

Primary cancer of the liver is not exceptional in France, for 22 of the 26 patients studied by the author were observed in the course of 4 years in the department of pathological anatomy of 1 hospital. To these 22 cases (13 of which belonged to the cases of the 25 patients mentioned in the preceding report), the author adds 4 other cases observed by him elsewhere. Of the 26 primary epitheliomas of the liver, 21 were malignant hepatomas, 3 were malignant cholangiomas, and 2 were hepatocholangiomas. From the macroscopic point of view it appears that the distinction between massive and nodular tumors is rather artificial, since in reality the neoplastic masses that are the most voluminous result from the confluence of rather small foci. The cirrhosis associated with 86% of the cases of cancer of the liver varies in type, but generally it is macronodular. Histological and histogenetic studies suggest the unity of hepatoma and cholangioma, because these 2 malignancies may be associated in the same tumor. It appears that the histological aspects of epithelial tumors of the liver are related to the metaplastic phenomena, representing a functional adaptation to the biological conditions different from the normal.

Extensions and metastases are frequent, particularly the extensions of hepatomas into the portal veins. Malignant cholangiomas most often are "lymphophilic." These metastases often differ regionally; thus, the hepatocellular aspects predominate in the lymph node metastases (even if the hepatic tumor is a malignant hepatoma). The lesions of sclerous hepatitis that are associated with primary epitheliomas of the liver may be classified into 2 categories: (1) secondary reactive sclerosis either around or inherent in the neoplasm; (2) true cirrhosis which may be nodular or diffuse and which precedes the cancer chronologically. It seems likely that the nodule of cirrhotic regeneration constitutes a favorite territory for the development of cancer and that the latter would result from a regional change involving all the tissue components of the segment. This idea of cancerization of certain zones is applicable to cancer without cirrhosis which is initially localized in the periportal and paraportal regions. The growth of the tumor results more from the confluence of the initial foci subsequent to successive exacerbations than from a destructive eccentric growth connected with an exuberant proliferation. This establishes a true unity in the evolution of the neoplastic processes of hepatobiliary tumors.

Comments on Present-Day Dietetic Therapy in Acute Hepatitis and Cirrhosis. R. Fauvert and J.-P. Benhamou. Semaine hôp. Paris 34:152-157 (Jan. 20) 1958 (In French) [Paris].

Dietetic treatment has traditionally played an important role in hepatic diseases, but whereas earlier authors recommended a diet high in sugar and low in fats and in proteins, more recently some investigators have placed emphasis on a high-protein content, to which lipotropic factors are generally added. These opposing views have given rise to a critical evaluation of the strict, yet constantly changing diets. The authors evaluate dietetic measures in acute hepatitis, in cirrhosis without and with ascites, and in hepatic coma. They show that the diet of a patient with acute hepatitis is dictated by the course of the disease. At the onset there often exist nausea and anorexia, which result in a quantitatively reduced diet. When the appetite returns, a calorically adequate, well-balanced diet, as appetizing as possible, should be provided. It is useless to impose a hypercaloric diet, rich in proteins and low in fat. Alcohol in any form should be forbidden.

The diet in cirrhosis not complicated by ascites or hepatic coma must be adequate, providing at least 2,000 calories daily. It must also be well balanced, including normal amounts of protein, fat, and sugar. There is no need of an excessive amount of protein, a reduction in fats, or the addition of lipotropic factors such as choline or methionine. The total prohibition of alcohol, however, is indispensable. The diet of patients with cirrhosis and ascites should be as low in sodium as possible, containing less than 100 mg. of sodium chloride per day. This sodium restriction must be continued for a long time. In patients with hepatic coma or precoma, a high-protein diet and the administration of methionine might cause aggravation rather than improvement. A diet low in protein is advisable and should be continued for several months in order to avoid recurrences of hepatic coma.

The Aetiology of Primary Hyperoxaluria. H. E. Archer, A. E. Dormer, E. F. Scowen and R. W. E. Watts. Brit. M. J. 1:175-181 (Jan. 25) 1958 [London].

The authors report on a 22-year-old man and an 11-year-old girl with primary hyperoxaluria, a rare disease characterized by progressive bilateral calcium oxalate urolithiasis, nephrocalcinosis, and recurrent infection of the urinary tract. Experimental studies were carried out in these 2 patients in an attempt to determine whether they excreted supernormal amounts of oxalate in the urine after the ingestion of this anion. Other experiments were carried out to test indirectly the concept that glycine is the precursor of at least some of the oxalate which these patients excreted. The latter experiments comprised a study of the effect of a low-protein diet, the administration of large doses of sodium benzoate, and the administration of large amounts of glycine on the excretion of oxalate in the urine. A limited number of comparable observations were made on 2 normal persons.

The magnitude and the time course of the increase in the urinary oxalate excretion associated with sodium oxalate feeding closely resembled that found in comparable experiments with normal persons, although both patients in contrast to the normal persons had shown grossly increased excretion of oxalate in the urine on repeated determinations made before the oxalate feeding experiments. These findings suggest that the persistently high excretion of oxalate in the urine of patients with primary hyperoxaluria is not due to excessive gastrointestinal oxalate absorption, nor does it appear, according to the present state of knowledge, to result from a low renal oxalate threshold. Depletion of the free glycine metabolic pool lowered the urinary oxalate excretion temporarily in the patients with primary hyperoxaluria. It is suggested that this finding is compatible with the hypothesis that at least some of the primary oxalate in patients with primary hyperoxaluria is derived from glycine, and that there may be a failure to degrade this amino acid normally by way of glyoxylate to formate and carbon dioxide in these patients.

Evaluation of Uricosuric Agents in Chronic Gout. M. A. Ogryzlo and J. Harrison. Ann. Rheumat. Dis. 16:425-437 (Dec.) 1957 [London].

Experience gained during the past 7 years with the prolonged administration of probenecid demonstrated that continuous therapy with a uricosuric agent in effective doses is the only practical method at present available for preventing complications and morbidity in patients with chronic gout. The present study was undertaken in order to compare a number of uricosuric agents in the treatment of patients with chronic gout. Evaluation was made on the basis of their efficiency in the following respects: (1) stimulating an increased excretion of uric acid in the urine; (2) lowering the serum uric acid concentration; (3) sustained action over prolonged periods; (4) prevention of attacks of gouty arthritis; and (5) toxicity. The following agents were studied: probenecid (Benemid), phenylbutazone (Butazolidin), thiophenylpyrazolidine (G25671), sulfoxyphenylpyrazolidine (G28315), acetylsalicylic acid (Aspirin), and ethyl biscoumacetate (Tromexan).

All the drugs were administered in divided doses throughout the 24 hours. Many of the patients received courses of more than one drug in the period under study. The observations included a number of short-term studies in a metabolic unit on controlled diets as well as prolonged administration without dietary control to patients on the general medical wards or in the outpatient clinic. The uricosuric effect, suppression of recurring attacks of acute gouty arthritis, and clinical improvement in the chronic gouty manifestations were distinctly superior with the 2 new phenylbutazone derivatives, G25671 and G28315. Per unit of weight, they were, respectively, about 3 and 6 times as potent as probenecid, both in lowering the level of the serum uric acid and in increasing the urinary excretion of uric acid. This uricosuric action appeared to be well sustained over periods of 3 to 12 months. No serious toxic manifestations were noted in the patients studied, although this possibility must be kept in mind.

Systemic Lupus Erythematosus an Increasing Problem: A Clinical Survey of 35 Cases. D. L. Thurman, E. C. Toone Jr. and J. H. Vaughan. Virginia M. Month. 85:71-74 (Feb.) 1958 [Richmond].

This paper records the clinical patterns established in 35 patients with systemic lupus erythematosus who were observed over a 5-year period (1951-1956) at the Medical College of Virginia. The diagnosis was clearly defined in 32 patients, while in the other 3 patients L. E. cells were found although the clinical features were atypical. The age of onset ranged from 13 to 63 years. The initial manifestations of systemic lupus erythematosus were quite varied: 19 patients gave a history of joint involvement as the initial symptom, 2 of dermatitis, 2 of pyuria and hematuria, 2 of malaise, 1 of chest pain, 1 of alopecia, 1 of chills, 1 of anemia with jaundice, and 1 of Raynaud's phenomenon. In 5 instances the initial symptom could not be ascertained. Fever is the most consistent manifestation of systemic lupus erythematosus, and all these patients gave a history of having had fever either continuously or intermittently. Twenty-four patients had experienced appreciable weight loss prior to diagnosis.

The absence of L. E. cells did not exclude the disease if other characteristic symptoms were present. Many signs indicated that the disease involves primarily the connective tissues with many and varied clinical manifestations of the joints, the kidneys, the central nervous system, the hematological components, the heart, the skin, the lungs, the gastrointestinal tract, and the lymph nodes. Pulmonary and renal involvement was associated most often with a fatal outcome. A thrombocytopenia was not correlated with a palpable spleen in this series of patients. Leukopenia was associated with an exacerbation of the disease in the majority of these patients. Systemic lupus erythematosus was not associated with an elevated blood pressure unless renal involvement with nitrogen retention was present.

An Analysis of 2000 Consecutive Sigmoidoscopic Examinations. J. A. de Jesús-Sanjuan, F. Hernández-Morales, J. M. Torres-Gomez and J. A. Freire. Bol. Asoc. méd. Puerto Rico 49:241-247 (July) 1957 (In English) [Santurce, Puerto Rico].

Two thousand consecutive sigmoidoscopic examinations were performed at the San Patricio Hospital of San Juan, Puerto Rico, between 1950 and 1956. All the patients were adult men, most of them between the ages of 25 and 50 years. The examination was performed for the purpose of verifying a diagnosis of suspected colonic lesions. The patients were either living in an area that was endemic to Schistosoma mansoni or had signs or symptoms of esophageal varices, liver dysfunction, spider hemangiomas, splenomegaly, gastrointestinal disorders, hemorrhoids, diarrhea or dysentery, rectal bleeding, or constipation. The conditions most frequently found were hemorrhoids, polyps, shigellosis, fissures, papillitis, carcinoma, and nonspecific ulcerations. Sixty-one patients had rectal polyps, and 15 had cancer (14 cases of carcinoma and 1 of lymphoma). One of the patients with cancer was transferred from another hospital, because the results of a biopsy of a lymph node specimen at the neck showed metastases of adenocarcinoma. Most of the patients with cancer were over 60 years of age. Cancer was within the reach of the examining finger in 11 of the 15 patients. Carcinoma was associated with polyps in 2 patients. A comparison of the results of the sigmoidoscopic examination in the subjects of this report with those reported from American sources showed that the incidence of polyps and carcinoma in Puerto Rico is lower than the incidence in the United States. The American patients in the report taken for comparison were asymptomatic, whereas the Puerto Rican patients were suffering from gastrointestinal disorders which led to the sigmoidoscopic examination.

SURGERY

Paranasal Transethmoido-Sphenoidal Hypophysectomy in Metastasizing Carcinoma of the Breast. F. Escher, F. Roth and H. Cottier. Schweiz. med. Wchnschr. 88:49-56 (Jan. 18) 1958 (In German) [Basel, Switzerland].

Hypophysectomy in patients with metastasizing breast carcinoma aims at exclusion of the tumor-growth-promoting hormones, that is, steroids of the ovary and of the adrenal cortex as well as prolactin (mammotropin) and the growth hormone of the hypophysis. The authors used the nasal approach to the hypophysial region. They regard Chiari's paranasal transethmoidosphenoidal hypophysectomy as the best method. An incision into the internal angle of the left eye is followed by resection of the lateral wall of the nose and by ethmoidectomy, and this by resection of the posterior end of the septum and opening of the sphenoid sinus. Then follow exact topographic localization of the sella, under roentgenologic control, and thinning and removal of the anterior wall and base of the sella. Aspiration tubes are inserted into the sphenoid sinus through the right nostril, the course of the dural vessels is identified, and a transverse or crosswise incision is made. Then the protruding hypophysis is removed with the aid of raspatory, angular spoons and a sphenoid-scoop punch. This method is much less trying for the patient than is transcranial hypophysectomy.

The authors used this paranasal transethmoidosphenoidal method in 26 patients, many of whom were in extremely poor general condition, and yet there was no surgical mortality from this operation. Complete removal of hypophysial tissue should be attempted, although neurosurgeons, such as Olivecrona and Pearson, maintain that this is rather difficult. The authors did not succeed in removing all the hypophysial tissue in the first 11 patients, but in 11 of the last 15 patients they did accomplish this. However, patients in whom the removal is not complete may react favorably to the hypophysectomy. The extent of the removal can be ascertained by hormone studies. Complete exclusion of the hypophysis can be assumed if the 24-hour elimination of 17-ketosteroids amounts to less than 2 mg., if the elimination of follicle-stimulating hormone is not detectable, if the basal metabolic rate is minus 20% or less, in the presence of a protein-bound iodine content of less than 3.5 mcg. per 100 cc. and with iodine-tracer studies indicative of hypothyroidism. The results are more favorable with complete than with subtotal removal of the hypophysis. The effects of hypophysectomy were most noticeable in the bone metastases, but even if there are no objective signs of remission, there is usually a considerable reduction in pain. No influence was exerted on metastases of the liver and the brain. Contrary to the experiences of other investigators, the authors observed no correlation between the patient's age and the effectiveness of the hypophysectomy. Substitution therapy in patients with total hypophysectomy requires the daily administration of 12.5 to 25 mg. of cortisone and 50 to 100 mg. of desiccated thyroid. The dose of cortisone must be increased under conditions of stress.

Carcinoma of the Base of the Tongue. L. A. Passalacqua. Bol. Asoc. méd. Puerto Rico 49:268-276 (July) 1957 (In English) [Santurce, Puerto Rico].

Thirty-six patients who had carcinoma of the base of the tongue were treated in the Veterans Administration Center, San Juan, Puerto Rico, during the years 1947 to 1956, inclusive. They were divided into 3 groups from the point of view of treatment: 11 patients received irradiation alone; 4 patients were treated by surgical means only; and 21 patients had surgery and irradiation. Squamous-cell carcinoma was diagnosed microscopically in 35 patients, and in 1 patient the tumor was a huge rhabdomyosarcoma. Nineteen tumors were of type 1 or type 2, 9 were of type 3, and a report on the type of the tumor was not made in 8 cases. The diagnosis in all these patients was made by the history, physical findings, direct laryngoscopy, and anatomicopathological tissue examination. At the first examination, 7 patients did not have palpable metastases, 27 had unilateral metastases, and 3 had bilateral metastases. Of the 11 patients who had radiotherapy alone, 6 died during the first year after radiotherapy and 1 during the second year. Four patients are living, all of them having received radiotherapy less than 1 year before appearance of this report. Surgery alone was instituted in 4 patients. Three patients are still living 2 years after the operation, and 1 patient died 2 years after the operation. Radiotherapy was followed by surgery in 5 patients. One died 3 years after the treatment. The other 4 patients are still living, 1, 1 year, 2, 2 years, and 1, 6 years after treatment. The patient who is living 6 years after the operation had a lobectomy for a solitary metastasis in the lung 4 years after the operation, and he has remained well during these 2 years after the lobectomy. Primary surgery consisting of a 1-stage resection of the primary lesion plus block dissection of the cervical metastases, followed by a full course of radiation, was performed on 12 patients. Seven patients are still living, 2, 1 year, 2, 2 years, 2, 3 years, and 1, 6 years after the operation and irradiation. The deaths of 5 patients occurred 1, 2, 3, 4, and 6 years after the treatment. The reported results confirm the claim that the treatment of carcinoma of the tongue consists of surgery and radiotherapy, no matter whether surgery is first and radiotherapy next, or vice versa. If the lesion is well differentiated and not extensive, a 1-stage resection of the primary lesion plus block dissection of the cervical lymph nodes is performed, and this is followed soon afterward by a full course of radiation. If the lesion is highly undifferentiated and extensive, the procedure is the reverse.

Thyroidectomy: One Thousand Cases. A. Pryde. M. J. Australia 1:66-69 (Jan. 18) 1958 [Sydney].

The mistakes made in the course of 1,000 consecutive thyroidectomies performed by the author between 1943 and 1955 are discussed. Commenting on the incision, he emphasizes the value of a barely visible scar. Injection of local anesthetic fluid into a blood vessel was subsequently followed by convulsions and unconsciousness in 1 patient, in whom the precaution of aspirating before injection must have been omitted. The woman had no recollection of the accident, and the operation proceeded. In one patient the trachea was accidentally opened; closure was carried out at once without complication. Dissecting the thyroid from the trachea with a knife, while the patient's head is extended over a pillow, involves this danger; less extension and the use of scissors make for greater safety. Forceful pulling of the thyroid medially with pressure of a retractor on the deep lateral aspect of the gland could cause damage to the recurrent nerve. This was presumably the reason for its occurrence in 2 of the 3 patients in this series in whom paralysis of 1 vocal cord was observed postoperatively. Interference with the sympathetic chain producing Horner's syndrome occurred 4 times. In 1 of these 4 patients the syndrome still persisted 12 months later. The author suspects that in this case he tied the sympathetic chain in mistake for the inferior thyroid artery. He has made it a rule not to tie anything that is not pulsating.

Spasm of the vocal cords occurred on several occasions. The use of muscle relaxants relieves the spasm almost immediately. Pneumothorax occurred twice, and in one instance it was traced to the needle in the lower pole. Injection of the lower pole has been discarded since then. Postoperative tetany occurred 14 times. All patients responded to calcium therapy. Tying both inferior thyroid arteries is not considered as a predisposing factor to tetany. Bleeding deep in the wound required its reopening in 10 of the patients. The chief signs are increasing swelling, tenderness, and discomfort. It is better to reopen the wound early rather than to delay. Rarely is a bleeding point found. The wound is packed, the ends of the gauze strips being brought out through a gap between the skin clips. Tracheotomy became necessary on 2 occasions, when bleeding within the wound had been diagnosed but reopening had been delayed. Tracheotomy relieved the situation, and the patients recovered without further complication.

The usual postoperative course is for the wound to be well healed on the 6th day. Occasionally a cloudy serous collection was released on the 4th or the 5th day, and the patient's stay in the hospital was prolonged a day or 2. In 2 cases the collection was frankly purulent, and healing was delayed some days. The occurrence of gross exophthalmos some months after operation in 2 patients is not regarded as the result of errors; the causation of this condition is still obscure. The pyramidal lobe of the thyroid gland is present in about 1 in 10 cases. If a portion is left at operation, it will enlarge. The author had this happen several times in earlier cases. It is essential to remove the whole of this lobe. Many recurrent nodules in the pyramidal lobe respond to thyroid therapy and rapidly become smaller, but they never entirely disappear. Those that do not respond may require excision if they are unsightly. On several occasions the portion of the thyroid gland left at operation did become enlarged. The treatment of the recurrence is the same as of the pyramidal enlargement. Postoperative crises occurred in 6 patients; 3 of these occurred before the use of thiourea. One of the 6 patients died; the others recovered with suitable treatment. The mortality rate for the 1,000 patients was 0.7%. The cause of death in each of the 7 patients was different. In only 3 were there signs of toxicity before operation. The other 4 had the following factors in common: the patients were women in the middle-age group; the goiters were nodular and were of many years' duration; the goiters were moderately large, of an average weight of 200 Gm., and were situated deeply; and all the patients had some pressure symptoms. The histories of the 7 patients who died are presented.

The Rationale of Thyroidectomy for Hashimoto's Thyroiditis: A Premalignant Lesion. W. F. Pollock and D. H. Sprong Jr. West. J. Surg. 66:17-20 (Jan.-Feb.) 1958 [Portland, Ore.].

In the last 5 years 30 cases of Hashimoto's thyroiditis were diagnosed at Santa Monica Hospital, and in the last 2½ years 22 cases were detected at Saint John's Hospital. In this group of 52 patients, there were 6 in whom malignant thyroid tumors were found in association with Hashimoto's thyroiditis. The 6 patients were women. In none was the preoperative diagnosis completely correct. The operations were done because of fear of malignancy in a nontoxic nodular goiter. Hashimoto's thyroiditis was not diagnosed preoperatively in any of the patients. In 4 patients lymph nodes in the area were removed, and 3 nodes revealed metastatic malignancy.

The discovery of six malignant tumors among 52 cases of Hashimoto's thyroiditis gives an incidence of 11% malignancy. This agrees with previously reported figures of 12 and 13%. This incidence of malignancy in goiters containing Hashimoto's thyroiditis constitutes a definite indication for surgery. Exploration of goiters thought to contain Hashimoto's thyroiditis is preferable to needle biopsy because of greater diagnostic accuracy, greater therapeutic benefit from extirpation and decompression of trachea and esophagus, and evaluation of regional lymph nodes. Hashimoto's thyroiditis is a premalignant lesion for which surgery is definitely indicated.

Tumours of the Parotid Gland: A Histological Study and Results of Combined Surgical and Radiological Treatment. S. Bruzelius, E. Cederquist, F. Linell and F. Bergman. Acta. chir. scandinav. 114:1-9 (No. 1) 1957 (In English) [Stockholm].

The authors report on 180 patients with parotid tumors treated by combined radiologic and surgical therapy between 1935 and 1950. The tumors were classified histologically according to the system of Foote and Frazell. This classification also is useful for planning the treatment. Of the 180 patients, 131 had mixed tumors, 14 had mucoepidermoid tumors, another 14 had adenocarcinoma, 4 had papillary cystadenoma lymphomatosum, and 17 had unclassified tumors. One hundred eighteen patients had benign mixed tumors, and 49 had malignant tumors of different types. The remaining 13 patients had cystadenolymphomas and benign unclassified tumors which healed without complications, and there were no recurrences. Of the 118 patients with benign mixed tumors, 81 received primary combined surgical and irradiation treatment at the University Hospital of Lund, Sweden, and were followed up for 5 to 18 years; there were no recurrences. Seventeen patients had been treated primarily at other hospitals and were referred to the University Hospital of Lund for recurrences. They were given combined surgical and irradiation treatment. Fifteen of the 17 patients did not have recurrences, but 2 did. These 2 patients were reoperated on and were given subsequent irradiation therapy; they then remained free from recurrences for 8 and 11 years respectively. Permanent paresis of the facial nerve occurred in 9 of the patients who received combined therapy. Delayed healing was noted in 19 patients, and salivary gland fistulas which healed spontaneously occurred in 6 patients.

The principles of treatment employed were as follows. Except for superficial tumors readily movable under the skin, surgical treatment was preceded by telegamma treatment. Surgical intervention was carried out 3 to 4 weeks later through an incision long enough to permit identification of the facial nerve and extensive removal of the tumor. The surgical specimen was subjected to histological examination by the pathologist in the course of the intervention. If the diagnosis was one of benign mixed tumor, radium tubes were placed in the wound cavity. No change in these principles of treatment is considered to be indicated. Of the 49 patients with malignant tumors, 21 had recurrences on one or more occasions. The disease was fatal in 18 patients, and death occurred within 5 years in 14 of them. The treatment consisted of extirpation of the tumor with preoperative and postoperative irradiation. Because of the less encouraging results, the method of treatment was modified to total parotidectomy with neck dissection followed later by external radiotherapy.

Resection of Tuberculous Remaining Kidney: Two Cases. O. H. Hansen. Ugesk. læger 119:1640-1644 (Dec. 19) 1957 (In Danish) [Copenhagen].

In the 2 cases presented, nephrectomy had previously been performed in one kidney because of renal tuberculosis. At the time of the operation no roentgenologic changes were demonstrable in the other kidney. Tubercle bacilluria persisted, however, in both cases, and roentgenologic signs of tuberculosis in the upper pole of the remaining kidney appeared. In spite of intensive chemotherapy bacilluria continued, and aggravation was demonstrated in both cases. Resection of the upper third of the remaining kidney was done, although the first patient was resistant to streptomycin therapy. The postoperative course was uneventful except for transient hypertension in the second patient. The usual examinations showed no reduction of renal function. After the resection no tubercle bacilli were found in the urine.

Melena and Hematemesis as Symptoms of Rupture of the Liver. F.-K. Mörl. Zentralbl. Chir. 82:2051-2054 (Dec. 14) 1957 (In German) [Leipzig, Germany].

Ruptures of the liver as the result of abdominal trauma caused by a dull force are usually on the surface of the liver. Shock, hemorrhage, and escape of bile into the abdominal cavity are the leading symptoms. It is not so well known, however, that melena or hematemesis may occur, sometimes as a late symptom, in central rupture of the liver. The occurrence of tar stools after such injuries becomes understandable when it is considered that, when torn lesions occur in the intrahepatic vessels or when bleeding results from central hepatic necrosis, the bile passages are opened simultaneously, so that blood can enter them, as well as the intestine, and subsequently appears in the feces or in the vomitus. The author presents the history of a 6-year-old girl who had sustained a severe impact on the upper abdomen. Operation 5 hours after the accident disclosed a rupture on the surface of the right lobe of the liver, which was repaired, and this was followed by temporary improvement. Later, tar stools were noted and red blood was also found in the stools, and there were repeated bouts of hematemesis. Despite repeated operations, the child died, and only autopsy disclosed the central hepatic rupture, a large cavity filled with detritus, and parenchymal necroses, deep in the liver. The bile ducts of the liver, the gallbladder, and the choledochus were filled with coagulated blood.

Although reports in the literature do not give a clear answer as to how this child might have been saved from death by hemorrhage, the author found reports of 17 similar cases in which melena resulted from central hepatic rupture. He mentions Spector's report (1957) on the successful ligation of the hepatic artery on the right in a patient with post-traumatic melena. He feels that, while this measure could be effective in other patients, it presupposes unilaterality of the lesion and recognition of the correct side. Furthermore, central hepatic rupture may involve not only branches of the hepatic artery but also those of the portal vein or of hepatic veins, that is, vessels from which hemorrhage could not be controlled by ligature of a branch of the hepatic artery.

Polycystic Kidneys and Cerebral Aneurysms: Observations on 3 Cases. J. Brihaye and N. Toppet. Acta clin. belg. 12:462-476 (Sept.-Oct.) 1957 (In French) [Brussels].

The frequency of intracranial hemorrhages in patients with polycystic kidneys is well known, but there is no agreement as to their cause: whether they are due only to arterial hypertension of renal origin; whether they are caused by rupture of an aneurysm, the formation and development of which are also related to arterial hypertension; or whether perhaps the aneurysmal vascular malformation is contemporaneous with the polycystic renal deformity. The authors present the histories of 3 personally observed patients, ranging in age from 29 to 44 years, in all of whom autopsy confirmed the association of polycystic kidneys and cerebral aneurysm. These 3 patients were found among 32 patients with cerebral aneurysm. It is the opinion of the authors that renal polycystic disease should be considered as a dysplastic disorder, which belongs to the large group of encephalosplanchnic malformations, one form of which is characterized by the association of polycystic kidneys with cerebral aneurysm. Numerous clinical observations indicate that these 2 elements have the same congenital and dysplastic character.

The arterial hypertension, which is produced by the polycystic renal defect, plays only an accessory role in the development of the cerebral aneurysm; however, on meeting the lesser resistance in the parietal zone, the aneurysmal pouch may increase in caliber and then burst. Intracranial hemorrhage is a frequent complication in patients with polycystic kidneys, and it may cause death long before arterial hypertension becomes severe. On the basis of cases studied in detail, it can be stated that intracranial hemorrhage in most of these cases is connected with one or several aneurysms. Consequently, it appears advisable to inquire into the possible existence of a cerebral aneurysm in all patients with polycystic disease of the kidneys. Cerebral angiography will disclose the presence and location of the cerebral aneurysm and will permit the evaluation of therapeutic possibilities. Surgical treatment might take the form of ligation of the carotid artery at the level of the neck or ligation of the aneurysm itself.

Treatment of Perforated Gastric or Duodenal Ulcers: Report of 102 Cases Treated by Simple Suture. H. J. Thörmer and K. A. Weber. Zentralbl. Chir. 82:2047-2051 (Dec. 14) 1957 (In German) [Leipzig, Germany].

The authors performed simple suture in 102 patients with perforated ulcers, not only in patients in whom there was a contraindication to primary resection but also in patients who would have tolerated such an operation. Seventy-one (69.6%) of the patients in whom the perforation was repaired by simple suture subsequently required a resection. The question is raised whether it is possible to decide between the advisability of simple suture or primary resection when the patient is first seen. Primary resection is advisable in the presence of pyloric stenosis, of a chronic callous ulcer, or of carcinoma, which can usually be detected by inspection and palpation. The choice between simple suture or resection is more difficult in patients with so-called acute ulcer, because these patients frequently do not have a predisposition to recurrent ulcer but are "occasional" ulcer patients, who generally state that they have had no ulcer symptoms prior to the present attack and that the perforation was a surprise. There is no method available which definitely establishes the presence of an acute ulcer, for there are also chronic ulcers which do not produce symptoms before perforation.

Nevertheless, the previous history is of decisive importance in the choice between primary resection and simple suture. Among 22 patients in whom thorough questioning did not reveal previous ulcer symptoms, 15 were rendered free from complaints by simple suture, whereas 7 required resection subsequently. Of 54 patients who had an ulcer history extending over a period of 1 to 10 years, 44 required a subsequent resection, and of 26 patients with an ulcer history of 11 to 20 years, 20 required subsequent resection. Treating a perforated ulcer only by suturing has the disadvantage not only that subsequent resection is required in many patients but also that a second perforation or a repeated hemorrhage is rather frequent in these patients. Another disadvantage is that in patients with a chronic ulcer there exists the danger of malignant degeneration. Furthermore, the mortality rate for simple suturing must be added to that for the subsequent resection. Statistical reports on large numbers have demonstrated that the mortality from primary resection, despite the fact that it is a more extensive operation, is not higher than that from a simple suture, provided that the patients have been selected properly.

On the basis of the follow-up examinations, the authors now prefer primary resection to simple suture and carry out this last intervention only under the following conditions: in severe shock, in the presence of extensive peritonitis, in patients for whom more than 6 to 12 hours have elapsed since the perforation, and in patients on whom extensive operations are contraindicated by such conditions as decompensated heart disease, severe coronary insufficiency, myocardial infarction, tachyarrhythmia, and coma. Modern methods of anesthesia, of preventing shock, of replacing electrolytes and blood, and of postoperative care make it possible for older persons to withstand primary resection about as well as do younger patients. The authors found that simple suture was adequate in only 2 of their patients over 60 years of age, whereas 7 of these patients required subsequent resection. The selection of a surgical method for perforated ulcer depends not so much on the age of the patient as on the type of ulcer.

Acute Cholecystitis: I. The Changing Characters of the Disease During the Last Sixteen Years. O. Olsson and Y. Edlund. Acta chir. scandinav. 114:25-39 (No. 1) 1957 (In English) [Stockholm].

The authors report on 895 patients with acute cholecystitis who were operated on in the surgical department of the Sahlgrenska Hospital in Gothenburg, Sweden, between 1940 and 1955. Two hundred fifty-eight patients were operated on during the first half of this 16-year period, and 637 were operated on during the second half. An analysis of the data for these 2 groups of patients shows that the character of acute cholecystitis has changed in several respects during the period of investigation. A high rectal temperature and pronounced abdominal tenderness were more common among patients in the first 8-year period, frequently requiring emergency operation. The relative incidence of acute cholecystitis showed a greater increase among men than among women. Acute cholecystitis in recent years appeared to be more common among patients aged less than 40 years than it was in the earlier period. A larger number of patients had more than 1 attack of biliary colic preceding the operation during the second 8-year period than during the first 8-year period. Stones impacted in the cystic duct and colorless bile in the gallbladder were more common in recent years than in earlier years.

The finding of the more common occurrence of high rectal temperature and more pronounced abdominal tenderness in the first 8-year period, suggesting that acute cholecystitis is less severe now than it was in earlier years, may in part be attributable to the fact that patients are hospitalized sooner after the onset of the disease than they were in earlier days. The surgeon's selection may, therefore, have affected the composition of the series in this respect. But all the other findings can scarcely have been influenced by changes in the indications for surgical intervention or by altered principles in the district served by the hospital. One may assume that the character of acute cholecystitis has changed, but one cannot yet express any opinion as to the cause underlying this change.

Primary Carcinoma of the Duodenum. L. Skalleberg. Acta chir. scandinav. 114:18-24 (No. 1) 1957 (In English) [Stockholm].

The author reports on 3 patients, 1 a 48-year-old man and 2 women aged 51 and 72 years, respectively, 2 of whom had primary carcinoma of the duodenum, and 1 had a malignant tumor of the duodenojejunal flexure. The man had vomited blood and gastric contents several times on the 2 days before admission and had had mild dyspepsia for several preceding weeks. Laparotomy was performed the next day. A hard mass was palpable in the superior part of the duodenum, infiltrating the head of the pancreas. Bleeding continued, and the patient died the same night. An adenocarcinoma arising from the duodenal mucosa and infiltrating the pancreas was revealed at autopsy. The younger of the 2 women had had a gastric ulcer since she was 23 years old. Four days before admission the patient complained of nausea and vomited. The day before admission she had repeated attacks of convulsion. She complained of cramp-like pains in the muscles. X-ray examination with the aid of a barium meal showed a healed gastric ulcer and a rigid area of narrowing in the distal part of the duodenum close to the duodenojejunal flexure. Resection of the involved segment of intestine, with end-to-end anastomosis between the duodenum and the jejunum, was performed. Pathological examination of the surgical specimen showed a constricting papillomatous tumor with central necrotic ulceration; microscopically the tumor showed hyperplastic duodenal mucosa with infiltration of papillomatous tumor tissue, in some places with duodenal gland formation. The patient made an uneventful recovery and was in good health when last seen 17 month after the operation. The second woman was admitted to hospital with a history of periods of vomiting lasting several days in the course of the preceding 3 months. Her symptoms were aggravated by solid food. Roentgenologic examination revealed a delayed evacuation of the stomach and upper part of the duodenum of 8 hours' duration. The contrast medium stopped abruptly at the duodenojejunal junction where a constricting area could be seen. A resection of the involved segment of the intestine was performed, with end-to-end anastomosis between the duodenum and the jejunum. Microscopic examination of the surgical specimen revealed adenocarcinoma infiltrating all layers of the intestinal wall but without involvement of the lymph nodes. The patient made an uneventful recovery but died of peritoneal metastasis 13 months after the operation.

Attention is drawn to the symptomatology, which may be nonspecific. The importance is stressed of including primary duodenal carcinoma in the differential diagnosis of cases in patients presenting with symptoms referable to the upper intestinal tract. Emphasis is placed on x-ray examination as an essential diagnostic aid, with the patient recumbent or in the right and the left lateral position. Small amounts of thick barium should be used, especially to rule out the extension of the process. Both treatment and prognosis are influenced by the late onset of symptoms and by the difficulty in diagnosing what still remains a rare condition.

Acute Pseudomembranous Enterocolitis. I. Becker and D. Brayton. West. J. Surg. 66:1-8 (Jan.-Feb.) 1958 [Portland, Ore.].

Acute pseudomembranous enterocolitis is a relatively rare, predominantly fatal disease which usually appears postoperatively but which may also occur in nonsurgical patients. After an uneventful postoperative course of several days' duration or after the administration of antibiotics for some days, malaise, nausea, vomiting, abdominal distention, and fever develop. These symptoms are followed by a fulminating diarrhea of copious watery stools and by severe shock. The diarrhea and shock prove resistant to therapy. The patient becomes progressively dehydrated, lethargic, and comatose. Death ensues after a relatively short period. The severity of the disease is variable. Typical membranes may be passed with stools or vomitus. The characteristic lesion may be seen by sigmoidoscopy. The roentgenogram of the abdomen shows the gas pattern of an adynamic ileus. The blood cell count usually reveals a moderate leukocytosis with a marked increase in nonsegmented neutrophils. The blood culture is negative. The pathological lesion is a fibrinous gray-yellow membrane which covers the mucosa in large areas or in patches. It separates relatively easily and reveals an ulcerated congested mucosa underneath. Most commonly, the small intestine and the colon are affected.

The histories of 6 patients with this disease treated during the past 5½ years are presented to illustrate the clinical findings, diagnosis, and therapy. One case is of special interest in that the disease appeared on 2 separate occasions after widely different stress situations. The various etiological possibilities are enumerated with reference both to the literature and to the cases at hand. The morphology of this disease is not pathognomonic of a particular etiological agent but is rather a general reaction of the intestine to various insults. Overgrowth of Staphylococcus aureus organisms in the intestinal tract is probably not the basic etiological mechanism in many of the cases.

NEUROLOGY & PSYCHIATRY

A Potent Central Analgesic, 2,2-diphenyl-3-methyl-4-morpholino-butyryl-pyrrolidine in Dextrose Solution (R 875): Its Application in Neurology. G. Boudin and J. Barbizet. Presse méd. 66:131-134 (Jan. 25) 1958 (In French) [Paris].

Animal experiments carried out by Janssen and co-workers showed that the analgesic effect and the therapeutic range of 2,2-diphenyl-3-methyl-4-morpholino-butyryl-pyrrolidine in dextrose (R 875) make it the most active of the analgesic drugs known today that have a low toxicity. The authors tested the effect of R 875 on the threshold of perception of pain in normal persons. After the administration of 10 mg. of R 875, the sensitivity to such stimuli as pinching of the skin, of the nails, and of the testes, which as a rule are painful, was reduced, with some of the persons tested having less pain and some having no pain whatsoever. In an attempt to measure the rise of the pain threshold induced by R 875, the appearance of the threshold of the sensation of burning and the time of the appearance of pain caused by cold were determined after the administration of R 875. Temperatures of 60 to 65 C (140 to 149 F) were tolerated without any pain in contrast to the appearance of the sensation of burning at a temperature of 50 C (122 F) without a preceding administration of R 875. Numbness of the fingers from exposure to cold, which may occur within 20 to 40 seconds in normal persons, was considerably delayed by the administration of R 875.

Clinical experience with more than 100 patients with various painful conditions revealed the favorable action of the drug on meningeal pain in patients with meningeal hemorrhage, acute meningitis, and headache secondary to pneumoencephalography and on radicular and truncal pain in patients with polyradiculoneuritis, polyneuritis, sciatic hyperalgesia, and pain resulting from cancer. But the most remarkable effect of R 875 was observed in patients with pain which up to now proved to be refractory to any medical treatment. The drug was particularly effective in patients with pain elicited by the posteroinferior nucleus of the thalamus, in those with facial neuralgia, in those with phantom pain after amputation, in those with neuralgic pain from herpes zoster, and in patients with tabetic crisis. R 875 was then given to 8 patients with psychalgia in whom a diagnosis of cenesthopathia associated with depression had been made. In these patients the drug proved to be ineffective; it was tolerated badly and the cenesthopathia frequently was increased. Thus, the effectiveness of the drug in patients with organic syndromes contrasted with its complete ineffectiveness in those with psychalgia.

R 875 may be administered orally or subcutaneously; the intravenous route of administration is contraindicated because of the risk of respiratory accidents. Certain undesirable side-effects of the drug, such as malaise, nausea, vomiting, and occasionally drowsiness, require care in administering it; rest in bed is advisable, at least for the initial phase of the treatment.

A Study of the Hearing Level Following Severe Poliomyelitis. R. Batson and F. McConnell. A. M. A. J. Dis. Child. 95:139-145 (Feb.) 1958 [Chicago].

The authors report on 37 selected, extensively paralyzed patients, between the ages of 5 and 37 years, with poliomyelitis who underwent detailed audiological assessment in order to determine the precise status of auditory acuity. The audiograms obtained from these patients were compared with those obtained during the same period from 2 groups of young adults without poliomyelitis. Nearly all the pure-tone thresholds in the patients with poliomyelitis departed from the zero decibel reference level by more than 10 db., indicating some depression of hearing acuity as compared with the levels in the control subjects, which adhered extremely closely to the zero decibel reference level, denoting normal threshold of audibility. Inspection of the pure-tone and speech thresholds in the patients with poliomyelitis revealed that more than 75% (28 patients) showed at least a slight depression of acuity which would be considered deviant from the norm. Numerous factors were considered in an effort to clarify the causative significance of the reduction in sensitivity to auditory stimuli in the patients with poliomyelitis. Factors such as age, sex, and possible drug therapy were not thought to influence these results. It was believed that depressed hearing responses could not be attributed to emotional disturbances or lethargy accompanying serious illness, since the patients gave oral responses to speech-hearing tests which required more physical energy than the effort required for signaling in response to pure-tone stimuli. It was found that the duration of disability did not correlate well with the extent of hearing loss. Several patients who were ambulatory and others who were in a wheelchair throughout the day demonstrated the same defect. A significant correlation, however, was observed between loss in hearing and loss in vital capacity. in that patients with marked decrease in vital capacity were apt to show significantly greater hearing loss. The significance of this is not clear, and it may be only a reflection of the severity of the disease in a particular patient. Because there are many other clinical symptoms more distressing to the patient and the physician, and since communication with such patients is usually at close range, reduction in sensitivity to auditory stimuli can be easily overlooked even when it reaches moderate proportions of severity. The causative significance of this finding is not clear.

A New Group of Psychotomimetic Agents. L. G. Abood, A. M. Ostfeld and J. Biel. Proc. Soc. Exper. Biol. & Med. 97:483-486 (Feb.) 1958 [Utica, N. Y.].

A group of piperidyl benzilates possessing anticholinergic properties were recently synthesized as possible antispasmodics in the treatment of duodenal ulcer. In the course of therapeutic trials, it was found that the tertiary amine hydrochlorides of the benzilate esters, although active anticholinergics, produced undesirable side-effects. particulary hallucinations. The quaternary ammonium salts, on the other hand, were entirely devoid of such effects. The authors recently obtained a series of such substances and examined their psychotomimetic effects on animals and human subjects. The psychotogenic effects of the N-methyl-3-piperidyl benzilate and related congeners were tested on more than 40 human volunteers. Although some of the patients had limited knowledge of the psychotogenic action of the drugs, the majority of the subjects were completely unaware of their nature. All the agents were tested for their behavioral effects on animals, including some 30 Siamese fighting fish, 50 rodents, and 5 cats. The action of these agents on the Siamese fighting fish is comparable to the action described for lysergic acid diethyl amide (LSD) by Abramson. In rodents there were marked behavioral changes, such as initial excitement and marked hyperactivity. spontaneous squealing. lack of responsiveness to stimuli. muscular weakness. and lethargy.

The compounds proved to be extremely powerful hallucinogens, in many respects more interesting than LSD and mescaline. When administered in oral doses of 5 to 15 mg. to human volunteers. distinct auditory and visual hallucinations occurred within 1 hour in every individual and recurred periodically for periods up to 10 hours after administration of the drug. Hallucinations were accompanied by gross distortions of visual images and severe alterations in feeling state. A number of subjects exhibited paranoid and megalomanic delusions, while the affective states ranged from a feeling of unpleasantness to extreme terror. Some of the subjects actually carried on conversations with imaginary individuals involving situations dating back 10 to 20 years. The subjects receiving 10 mg. (orally) of N-methyl-3-piperidyl benzilate were in complete loss of contact with the environment for many hours while experiencing dramatic visual and auditory hallucinations. In many respects these anticholinergic agents come closer to simulating clinical psychoses than do mescaline and LSD. Of all the compounds tested for hallucinogenic properties, N-Methyl-3-piperidyl benzilate is the most potent, with the N-ethyl derivative being somewhat less effective. The tetramethyl derivative is considerably less effective than the N-ethyl derivative. The quaternary derivative is devoid of psychotogenic effects. As for the antispasmodic potency, although the 3 substances possessing psychotogenic properties are perhaps the most potent, the remaining compounds are still quite effective.

Recurrence of Glioma of Cerebral Hemispheres: Histological Features and Therapeutic Possibilities. I. Papo and R. Tritapepe. Minerva chir. 12:1443-1446 (Nov. 30) 1957 (In Italian) [Turin, Italy].

A second surgical procedure was performed on 34 patients with a recurrent supratentorial glioma. At the first operation this tumor appeared to be an astrocytoma in 7 patients, an oligodendroglioma in 7, a glioblastoma in 16, and a changing type of tumor in 4. Histopathological changes from astrocytoma to glioblastoma were observed in 1 patient 11 months after the first operation. It is possible, however, that areas of glioblastoma were originally present. Atypical areas were found in sections of the oligodendroglioma in 4 patients, who were operated on, from 35 to 103 months after the first operation. This phenomenon could justify the differentiation of the oligodendroglioma. The immature and atypical features of glioblastoma became more evident at the second operation. A type of glioma, which originally appeared to be oligodendroglioma with atypical areas, changed into glioblastoma in 1 patient 25 months after the first operation.

The longest postoperative survival period in patients with astrocytoma was 19 months, in those with oligodendroglioma 21 month, in those with glioblastoma 26 months, and in those with a changing type of glioma 6 months. The authors point out that in most instances there is reappearance of the symptoms of glioma rather than its recurrence. Astrocytoma and oligodendroglioma often change into glioblastoma. There is no evidence to show whether this is due to the intrinsic characteristics of the tumor, to the surgical intervention, or to the x-ray therapy. A gradual higher degree of malignancy seems to develop even in those gliomas which did not originally present a neoplastic structure. Surgical therapy, with rare exceptions, affords no benefit to patients with recurrent glioblastoma but may be considered in patients with recurrent astrocytoma and oligodendroglioma.

GYNECOLOGY & OBSTETRICS

Induction of Ovulation in the Human: Therapeutic and Diagnostic Importance. H. S. Kupperman, J. A. Epstein, M. H. G. Blatt and A. Stone. Am. J. Obst. & Gynec. 75:301-309 (Feb.) 1958 [St. Louis].

The authors explain on the basis of a diagram the current status of knowledge of the normal cyclic functioning of the pituitary-ovarian axis. A defect or alteration in any one of this normally sequential series of interactions can result in menstrual irregularities, ovulatory failure, and/or amenorrhea. It was felt that specific hormone therapy in properly selected cases of failure of ovulation might artificially trigger the defective ovulatory mechanism. Since the proposed therapy theoretically was to be specific for an isolated defect in ovulation, patients with other hormonal imbalances that secondarily influence the pituitary-ovarian axis were not included in the series. The patients who were euthyroid with normal adrenal function and who menstruated fairly regularly or who menstruated after therapy with progesterone and showed an absence of pregnanediol with a flat basal body temperature were judged as having ovulatory failure and fulfilled the criteria established for the "potentially responsive" cases. Those whose only endocrinopathy was failure of ovulation received 20 mg. of conjugated estrogens (equine), administered intravenously as a single dose, not sooner than the 18th day of the menstrual cycle. Of the 40 patients treated, 31 were barren, and 9 were either single women with menstrual irregularities or married women practicing contraception.

Nine pregnancies resulted among the 17 infertile patients in whom ovulation was induced after no more than 2 injections of estrogens given intravenously at intervals determined by the patients' own basal body temperature charts. The history of infertility in the 9 women in whom treatment resulted in pregnancy ranged from 2 to 7 years. One of the nonpregnant patients had her first spontaneous ovulatory menses in 3 years in the cycle subsequent to the menses induced by estrogens given intravenously. Three other patients with a history of only infrequently occurring spontaneous ovulatory menses also had normal 28-day cycles for 1 period after that induced by estrogen. Moreover, 4 of the 9 pregnancies occurred during the cycle subsequent to the estrogen-induced ovulatory response. The negative responses were due to mechanical inability of the ovaries to respond to pituitary stimulation, i. e., polycystic ovaries of the Stein-Leventhal-like syndrome, where the thickened fibrous tunica presents a mechanical barrier to ovulation. Surgical exploration with bilateral ovarian wedge resection was advised in 8 of 12 infertile patients who were negative responders. In each of the 8 patients operated on, the diagnosis of polycystic ovaries was confirmed. The conclusion is reached that in anovulatory women, with normal or medically corrected thyroid and adrenal function, ovulation may be induced by triggering the release of luteinizing hormone with a single large intravenous dose of conjugated estrogens. The early diagnosis of surgically correctable ovulation defects may be made on the basis of absence of an ovulatory response to this therapy.

Viral Hepatitis and Pregnancy. M. Pirinoli. Semana méd. 64:1304-1308 (Dec. 26) 1957 (In Spanish) [Buenos Aires].

Forty-three pregnant women with pregnancies of between 4 and 8 months' duration and with viral hepatitis were observed at the Maternity Hospital of Cordoba City. Fourteen patients out of the 43, admitted in coma at different periods of evolution of the disease, spontaneously delivered premature babies (8 of whom died between the first day and the first week after birth). A woman in the 7th month of pregnancy spontaneously delivered a fetus which had died in utero. A woman in the 4th month of pregnancy had a spontaneous abortion. A therapeutic abortion or else a therapeutic parturition was induced in 5 women. On a woman who entered the hospital in deep coma, a cesarean section was performed, which resulted in saving the life of the patient, but the baby died 48 hours after birth. The 14 women who were admitted in coma at different periods of the disease presented 3 well-defined syndromes which have made it possible to classify the patients into 3 groups. Six of the 7 patients who died had prodromal symptoms of severe infection before the appearance of coma. In this first group the liver was reduced in size, and coma was preceded by convulsions, tremor, and delirium. Coma was deep, with pupillary rigidity, frequently irregular pulse and subnormal temperature, and final fever. The metabolic and anatomicopathological changes in these patients were severe. Six of the 7 patients who survived coma had had jaundice for 2 to 4 weeks before the appearance of coma. In this second group there were no other prodromal symptoms. The size of the liver did not change. Coma developed gradually and then became deep. The third group of 2 patients had acute yellowish atrophy of the liver; one died. The author concludes that viral hepatitis is severe in pregnant women and may cause acute massive necrosis of the liver. The only possibility of saving a patient under these threatening conditions is to stop pregnancy as soon as a diagnosis is reached. There is a group of clues for an early diagnosis, namely, slowness of sedimentation rate of erythrocytes, subnormal values for fibrinogen, and marked dysproteinemia. Hypercholesterolemia and urinary crystals of leucine and tyrosine indicate a poor prognosis in the direction of insufficiency of the liver, but these signs appear only in rare cases.

On the Problem of the Immunobiological Relationships Between the Human Mother and Fetus: II. Determination of Antigen Groups in Amniotic Fluid. L. S. Volkova. Bull. Exper. Biol. & Med. (Translation from the Russian) 41:965-968 (Nov.) 1956 [New York].

The author studied 197 specimens of amniotic fluid and the same number of blood specimens, obtained from corresponding mothers and newborn infants, regarding the presence of antigens of groups A, B, and AB. Neither antigen A nor antigen B was found in 39 specimens of amniotic fluid, and the blood specimens obtained from the newborn infants were also free from group antigens, while the blood of the mothers belonged to different blood groups. The presence of antigens A, B, and AB was established in the remaining 158 amniotic fluid specimens, and here also complete correspondence between the grouping of the amniotic fluid and the blood grouping of the newborn infants was found. These data suggest that the amniotic fluid of man is differentiated into groups and contains antigens which are identical with the blood-group antigens of the fetus (newborn infant). In no case were hemagglutinins found in the amniotic fluid which were lacking in the blood of the newborn infant, or vice versa.

The discrepancy between the author's findings and those of other investigators, who were not always able to find hemagglutinins in the amniotic fluid, is explained by the difference in the methods used to study the amniotic fluid. With consecutive dilution of the standard serums by the same sample of tested amniotic fluid, the most complete recovery of antibodies was obtained by the author. This technique, as well as the use of amniotic fluid in comparatively low dilutions or undiluted, permits the recovery of even small amounts of the group substances which are present in the amniotic fluid. In determining the quantitative content of the group substances in the amniotic fluid, it was established that the quantitative content is considerably greater than the amount of hemagglutinins which are present in the blood serum of the newborn infants and noticeably greater than those in the serum of the mothers. The quantitative differences among the group antigen contents of the amniotic fluid and the blood serums of the newborn infants and the mothers indicate that the group antigens of the embryonic fluids do not originate from the blood of the mother or the fetus. Group antigens of the amniotic fluid, like the fluid itself, form as a result of the secretory activity of the amnion, whose glandular structure has been confirmed conclusively. The presence of a large amount of group antigens in the amniotic fluid, which are identical with the blood-group antigens of the child, can play a significant role in the immunobiological relationships between the mother and the fetus. When there is serologic incompatibility between mother and child, the group substances in the amniotic fluid may agglutinate the corresponding isoantibodies of the mother's blood and protect the child's system from possible injury by this means.

Local Hydrocortisone Therapy of Vaginal and Vulval Pruritus. R. S. Finkler. Am. J. Obst. & Gynec. 75:319-321 (Feb.) 1958 [St. Louis].

The effect of locally applied hydrocortisone on genital pruritus was studied in 40 consecutive female patients seen in office practice. The complaint of pruritus was associated with a heterogeneous group of disorders, but the hydrocortisone was used primarily in an attempt to alleviate the pruritus, and the results were evaluated accordingly. The patients ranged in age from 17 to 74 years, with a median age of 47. Most of these women had a history of previous and largely unsuccessful therapy directed toward relief of the pruritus. Vaginal tablets containing 10 mg. of hydrocortisone were given to the patient with instruction to insert a tablet deep into the vagina once daily. In more severe cases, 1 tablet twice daily was prescribed for the first 2 or 3 days, after which the dosage was reduced if possible. In 31 of the 40 patients pruritus was practically eliminated, and in 3 others some benefit was ultimately achieved.

Undesirable effects of hydrocortisone therapy were absent. In no case was there any evidence of systemic absorption with its attendant complications, nor was there any sign of local irritation due to the hydrocortisone or its vehicle. Relief of pruritus usually occurred dramatically within the first 24 hours of treatment; it is noteworthy that, while the duration of therapy in half of the patients was 10 days or less, there was no return of pruritus when hydrocortisone was withdrawn except in 3 instances, in each of which the patient had been treated for 10 days or longer. Hydrocortisone therapy appeared to be equally effective in all age groups. Neither the onset of the menopause nor senile atrophic changes in the genitals were correlated with detectable differences in response. The author concludes from this trial of vaginal tablets containing hydrocortisone that this therapy is a safe and uniformly effective method of relieving genital pruritus in women; when it is combined with therapy effective against the underlying cause of the disorder, it can achieve complete and lasting relief in most cases.

PEDIATRICS

Cortisone and Salicylates in Chronic Relapsing Rheumatic Carditis. J. Lorber, K. S. Holt, J. Rendle-Short and R. S. Illingworth. Ann Rheumat. Dis. 16:481-484 (Dec.) 1957 [London].

The authors describe the response to combined cortisone and salicylate treatment of 6 children, 5 girls and 1 boy, who had 1 or more previous attacks of rheumatic fever. There had been continuous rheumatic activity for several months before hormone treatment was instituted, and all the patients had gross cardiac damage. All 6 children received cortisone or prednisolone in association with salicylates, either until 3 consecutive weekly normal erythrocyte sedimentation rates had been obtained or for longer periods if considered necessary. Taking relapses into account, these 6 children have received so far 14 courses of combined treatment. Three children responded promptly and did not suffer relapse. Two children responded well, but their condition relapsed several times as soon as treatment was discontinued. In 1 child the response, as measured by the erythrocyte sedimentation rate, was doubtful, and hematemesis developed as a result of treatment.

There is no doubt that combined cortisone and salicylate therapy improved the general health of these children. It could hardly be expected that long-existing cardiac lesions would regress under treatment, and, in fact, no such improvement occurred. In spite of the prolonged rheumatic activity, however, there was no deterioration in the state of the heart in any case. The response to treatment, as judged by the erythrocyte sedimentation rate, was not as uniformly satisfactory as in children treated in their first attack, although the initial response was satisfactory in 5 of the 6 children. The marked tendency to relapse was disappointing. It may be that these relapses occurred because the disease was so well established in these chronic cases that therapy could only be suppressive and not curative. It is suggested that combined therapy is a useful method in children with smoldering rheumatic carditis but that the duration of treatment may have to be prolonged.

A Study in the Transmission of Maternal Antibodies. H. I. B. Atkins. Brit. M. J. 1:187-190 (Jan. 25) 1958 [London].

The incidence of gastroenteritis, bronchitis with bronchopneumonia, and otitis media was recorded in 2 groups of female children who were studied with the long-term object of determining the relationship of breast feeding to breast cancer. The 534 female infants in the first group were known never to have received human milk, and an equal number of infants in the other group were breast-fed. Gastroenteritis occurred in 22 infants of the first group and in 21 of the second group; bronchitis and bronchopneumonia occurred in 60 infants of the first group and in 49 of the second group; and otitis media occurred in 11 children in each of the 2 groups. The slightly increased incidence of bronchitis and bronchopneumonia among the children in the "milkless" group was statistically insignificant. These results suggest that breast feeding has no effect on the incidence of these diseases. The incidence of the zymotic fevers, such as measles, rubella, chickenpox, pertussis, and epidemic parotitis, was likewise recorded in the 2 groups of female infants and proved to be strikingly similar. There also was no significant difference between the age incidence in the 2 groups for these diseases. These observations support the view that antibodies to the zymotic fevers, like antibodies to pyogenic infections, are not transmitted in man by way of the colostrum or in the maternal milk. The anatomic and biochemical evidence is described in support of the view that in man antibodies are transmitted from mother to offspring in utero.

Prednisone in the Treatment of Allergic Diseases in Children. S. J. Levin and P. Adler. A. M. A. J. Dis. Child. 95:178-184 (Feb.) 1958 [Chicago].

The authors report on 85 children, 55 boys and 30 girls, between the ages of 2 and 17 years, with acute allergic states who were treated with prednisone. Fifty-five of these patients had bronchial asthma, 11 had atopic dermatitis, 5 had perennial allergic rhinitis, 13 had seasonal pollinosis, and 1 had urticaria. In patients over 5 years of age, treatment was started with 10 to 20 mg. of prednisone in divided doses for the first 4 days, and subsequently the dose was decreased to 5 mg. on the 5th day and to 2.5 mg. per day for 2 more days. In younger children, less prednisone was used initially, and the dose was reduced in a fashion similar to that practiced in the older children. Eighteen of the 55 patients with asthma thus far required 2 courses of the drug, 5 required 3 courses of the drug, and 1 patient is on continuous maintenance therapy.

Prednisone for short-term therapy has been uniformly excellent for alleviating acute episodes of various allergic states, thus facilitating earlier allergic investigation or enabling long-term desensitization therapy to continue uninterrupted. The short-term use of this drug has been almost completely free of the undesirable side-effects, including excessive weight gain and hypertension, noted with the older steroid preparations. Especially in the short-term use of prednisone, low-sodium diets and the supplemental use of potassium are not necessary. Reports by other workers on serious untoward reactions associated with the long-term use of prednisone and other steroids in the treatment of allergic diseases in children suggest that the long-term use of these drugs should be reserved for the exceptional and extremely rare patients with intractable asthma or other chronic, debilitating allergic state. Even in such patients, thorough and persistent efforts to uncover and treat specific and nonspecific causes should be continued, so that eventually steroid therapy can be terminated. Since this paper was submitted, 4 children with severe bronchial asthma were treated with prednisone, 1 of whom required treatment for 4 weeks, 2 for 6 weeks, and 1 for 3 months, 2.5 to 5 mg. of the drug being administered twice daily after the patients had initially received higher doses. No undesirable side-effects were noted in these patients.

Mammalian Bites of Children: A Problem in Accident Prevention. H. A. Carithers. A. M. A. J. Dis. Child. 95:150-156 (Feb.) 1958 [Chicago].

The biting of children by pets is a common, although rarely fatal, accident. Of 617 children coming under the author's observation for routine pediatric care, 531 were over 1 year of age, and 15.4% of these had been bitten by a mammal, 2.1% of them more than once. The author reports on 157 children who in the course of over 20 months sustained bites from animals, including dogs, cats, rabbits, squirrels, horses, rats, hamsters, monkeys, skunks, and raccoons. The dog was by far the most frequent offender. The preponderance of evidence showed that usually the child was at fault in provoking the bite. Ninety-five of the children were boys, and 62 were girls. Most of the children bitten were between the ages of 2 and 10 years, during which period parental protection wanes, and adventurous and sometimes daring behavior takes place among children. There was little seasonal variation in bites. The location of mammalian bites is significant because of the danger of rabies after a short incubation period when one is bitten by an animal harboring the virus of this infectious disease. Fifty of the 157 children were bitten on the head, 58 on the upper extremities, 11 on the trunk, and 38 on the lower extremities. Treatment has been discussed in some detail, with particular reference to the problems of tetanus control and administration of rabies vaccine or serum.

Since the emotional and educational value of pets far outweighs the danger of bites and disease to which children are subjected from this source, 7 rules are suggested to help prevent accidental biting of children by mammals. These rules are as follows: 1. Children should not own pets until they can care for them and can show discretion in their handling, i. e., not until they are 6 years of age and older. 2. Older animals are to be preferred to immature ones as pets for young children. 3. Children should be taught that animals have rights, including an existence free of pain and excessive teasing. 4. In the early years children should be taught to avoid all strange animals, especially those sick or injured. 5. Even as toddlers, children should be taught not to trespass, and, as older children, when riding bicycles, they should deliberately avoid routes where dogs are known to chase vehicles. 6. Under the supervision of an adult, children should make friends with the pets in their immediate neighborhood. 7. Children should be instructed not to quell a fight between animals, even if their own pet is involved, but should try to get their pet away from the melee by cajoling. The relative frequency with which children in this survey sustained this type of accident emphasizes the need for preventive measures.

A One-Year, Controlled Study of the Effect of Low-Phenylalanine Diet on Phenylketonuria. D. Y.-Y. Hsia, W. E. Knox, K. V. Quinn and R. S. Paine. Pediatrics 21:178-202 (Feb.) 1958 [Springfield, Ill.].

Twenty-four patients with phenylketonuria from 3 state institutions for the mentally retarded in Massachusetts were brought to a hospital. They were divided into 12 matched pairs, comparable as to age, sex, intelligence, and length of institutional placement. One member of each pair was selected by lot to receive a phenylalanine-deficient diet for a 12-month period; the other member of the pair received a control diet identical in appearance and flavor. The identity of the control and the experimental patients was not known to those caring for them. Five unpaired, institutionalized patients and 5 outpatients also received low-phenylalanine diets. At the end of a test period of 12 to 15 months, the patients were evaluated in terms of adequacy of chemical control and changes observed in intelligence, behavior, skin condition, hair color, seizures, and electroencephalograms. Although prolonged therapy with low-phenylalanine diets is generally feasible while the patients are at home with their parents and under close medical observation, the program seems more difficult to achieve on a large scale in an institutional setting. Malnutrition severe enough to require discontinuance of the diet for temporary periods was observed in some of the patients. The low-phenylalanine diet is dangerous unless the patients are closely observed.

Estimation of the levels of phenylalanine in plasma is a more difficult test than that for urine phenylpyruvate, but it is essential since the plasma concentration may remain high when the urine is normal. Extremely low values for phenylalanine in plasma may require slight increase in phenylalanine intake. Death in status epilepticus has been reported, possibly associated with extremely rapid decrease in phenylalanine in plasma to nearly zero. The possible beneficial effect of a low-phenylalanine diet on intelligence was limited to 4 patients who were 6 months, 7 months, 1½ years, and 3 years of age at the time the diet was begun. Improvements in skin condition, in behavior, and possib in electroencephalograms were obtained in old individuals, but such benefits would not seem justify the difficulties and dangers of dieta therapy. These observations, together with the r ported results of other investigators, support t tentative conclusion that the metabolic disturbanc associated with the elevated concentration phenylalanine in plasma characteristic of phenylk tonuria interfere with normal cerebral develo ment rather than with the function of a normal developed brain. Recognition of phenylketonur at the earliest possible age and prompt institut of dietary control are essential if the possib therapeutic benefits of a low-phenylalanine di are to be conclusively evaluated.

Respiratory Illness in 6 Infants Infected with Newly Recognized Echo Virus. H. G. Cramble L. Rosen, R. H. Parrott and others. Pediatrics 2 168-177 (Feb.) 1958 [Springfield, Ill.].

Many viruses have been recovered in tissue cu ture from specimens taken from the alimenta tracts of children. Certain of these agents ha been given the name "enteric cytopathogenic h man orphan" (ECHO) viruses. So far 19 or mo antigenically distinct ECHO viruses have bee recognized. Studies were made on a group of i fants, who were newly admitted to an orphana in Washington, D. C., in order to explore the ro of newly isolated viruses as causes of disease i children. Each inhabitant of the orphanage w under surveillance in regard to excretion of viru In order to study the clinical manifestations ass ciated with these viral infections, new members the orphanage population were admitted to t clinical center of the National Institutes of Healt The 6 infants in this study ranged in age from 5 14 months. In all patients except 1, throat and an swabs for isolation of virus were taken at least times weekly. Serum was collected for testing appropriate intervals. Specimens from all 6 patien yielded a virus cytopathogenic for monkey kidne tissue cultures, which could not be identified as an described agent known to be cytopathogenic f this type of culture. The effect produced by th agent resembled that caused by most of the de scribed ECHO viruses. It was referred to as th JV-1 virus.

A close association was established between on set of infection with an ECHO (JV-1) virus and th onset of a mild clinical respiratory illness in 6 in fants, 5 to 14 months of age. The illnesses wer characterized by coryza, pharyngitis, and fever o short duration. Other manifestations included ab normal stools, erythema of the ear drums, and mil conjunctival congestion. There was evidence that 4 of the 6 children were already infected with JV-1 virus when first admitted to the clinical center. The other 2 patients became infected shortly after returning to the orphanage after the initial admission to the clinical center. The only known contact with illness in each case was in the virus-laden environment of the orphanage. The examination of paired serums taken from the infants during the acute and the convalescent stage of the illness demonstrated a rise in titer of both neutralizing and complement-fixing antibodies against the prototype JV-1 virus. Conversely, tests of serums taken during the same time period of the illnesses did not, with one exception, reveal rising antibodies against adenoviruses, type A of the Coxsackie viruses, type 8 of the ECHO viruses and types A, B, and C of the influenza viruses.

DERMATOLOGY

Sporotrichosis: A Report of Twenty-Three Cases in the Upper Extremity. R. J. Duran, M. B. Coventry, L. A. Weed and R. R. Kierland. J. Bone & Joint Surg. 39 A:1330-1342 (Dec.) 1957 [Boston].

Sporotrichosis is an infectious granulomatous disease caused by the fungus, Sporotrichum schenckii, which is found on plants, flowers, and trees, as well as in animals, insects, and birds. Sporotrichosis is most commonly seen in farmers, florists, and laborers and may be regarded as an occupational disease. The authors review observations on 23 patients seen at the Mayo Clinic. While in the world-wide distribution of cases 6 different clinical types (lymphatic, disseminated, epidermic, mucosal, skeletal, and visceral) have been recognized, the patients observed at the Mayo Clinic and in other American series fit into Moore's classification of 3 groups: localized, gummatous disseminated, and extracutaneous or systemic. In 21 of the 23 patients the disease began as the localized lymphatic type, and in 1 of these it progressed to the systemic type. Thirteen of the primary lesions occurred in the right upper extrimity.

The localized lymphatic type of sporotrichosis may be cutaneous or subcutaneous. The cutaneous form is characterized by ulcers, nodules, gummata, and abscesses, with the primary lesions at the site of injury. The wound of entry may be a previous one later contaminated by the organism, or the initial injury may introduce the organism by means, for example, of a contaminated thorn. From 20 days to 3 months may elapse between inoculation and appearance of the primary lesion. The primary abscess enlarges to form a nodule, which is at first semisolid, spherical, freely movable, and nontender. It then becomes attached to the skin, which is first pink and gradually becomes violaceous. The nodule forms a fluctuant center and ruptures spontaneously, forming a granulomatous ulcer, which bleeds easily and tends to crust. The ulcer may heal spontaneously, or it may remain open as the primary chancre; this may persist for months. Commonly, within a few days to a week after the appearance of the primary lesion, the fungus spreads through the lymph channels to produce an ascending chain of secondary subcutaneous nodules. The lymph channels may appear as firm, cord-like, painless structures. The nodules, which may number from 3 to 40 or more, are freely movable and painless. Later they become attached to the skin. They may also soften and ulcerate, discharging a thin, watery secretion. Nodules and ulcers may appear simultaneously, and these secondary lesions may persist for months or years if the disease is not treated.

The second type of sporotrichosis, the gummatous disseminated type, is rarely seen in this country, but 3 of the 23 patients studied by the authors had the third type, the extracutaneous or systemic type of sporotrichosis. The histories of these 3 patients are reported. One of these 3 patients died, autopsy revealing lesions in the brain and in the root of the first sacral vertebra. Potassium iodide remains the drug of choice for treating the localized lymphatic type of sporotrichosis. It is also of value in all other forms except involvement of the central nervous system. In the systemic type, the administration of 2-hydroxystilbamidine may be helpful. Although the authors have had little experience with bone and joint sporotrichosis, they believe that potassium iodide therapy in a systemic way (and perhaps 2-hydroxystilbamidine as well) and surgery, which would include synovectomy, drainage of abscesses, débridement, and other obvious surgical methods, should prove efficacious in treating skeletal sporotrichosis. This study represents the combined efforts of the sections of special bacteriology, dermatology, orthopedics, and plastic surgery at the Mayo Clinic and suggests the close cooperation so helpful in the diagnosis and treatment of sporotrichosis.

Disseminated Cutaneous Sporotrichosis with Systemic Involvement. G. W. Arthur and J. W. Albrittain. A. M. A. Arch. Dermat. 77:187-190 (Feb.) 1958 [Chicago].

The authors present the history of a patient with disseminated cutaneous sporotrichosis with visceral lesions, including a sporotrichotic scleral nodule and granulomatous uveitis. Eye involvement, such as this patient demonstrated, has rarely been described. The patient was a 64-year-old man who reported that about 10 months prior to admission he had noticed on his scalp an itchy, scaly area which did not heal. The nodules, which began to appear 4 months afterward, did not bother him except that some of them would open and drain a seropurulent fluid. His physician treated him with penicillin without relief. Physical examination revealed many subcutaneous nodules in various stages of development scattered over the entire body. An examination of the eyes revealed findings consistent with chronic glaucoma. A left-sided hydrocele was present, and there was swelling of the right knee. Soon after admission a nodule appeared on the medial portion of the patient's right sclera. Biopsy of a skin specimen revealed a granuloma, and fungus cultures from the nodules, hydrocele, and knee effusion consistently grew Sporotrichum schenckii. The patient was treated with increasing doses of potassium iodide solution, starting with 10 drops 3 times daily and increasing to 55 drops 3 times daily. Gastric irritation, which developed once, was overcome by a short (2 days) interruption of treatment.

At the end of 7 months, all skin lesions had apparently healed, and the dosage was lowered to 40 drops 3 times daily. The scleral nodule had also completely regressed, and the knee effusion had subsided. The medication was continued for 1 month after apparent cure, and the patient was followed for 4 months after therapy was discontinued. During this time he remained asymptomatic. When this patient was first seen, his lesions were considered pyogenic in origin. If attention were directed to the possibility of a fungus as the cause of some chronic granulomas, perhaps more cases of sporotrichosis would be correctly diagnosed early in the course of the disease. Other diseases to be included in the differential diagnosis are tularemia, glanders, tuberculosis, syphilis, drug eruption, leishmaniasis, and other deep mycoses.

Dermatitis Caused by Penicillin in Milk. H. R. Vickers, L. Bagratuni and S. Alexander. Lancet 1:351-352 (Feb. 15) 1958 [London].

Since the introduction of machine milking, the incidence of mastitis in cows has increased, and the common practice among herdsmen is to inject 100,000 units of procaine penicillin into the teat of the infected quarter. About 70% of the cases of mastitis in cows are due to Streptococcus agalactiae—an organism highly sensitive to penicillin—and the infection rapidly subsides. As a result of this treatment, milk may contain penicillin. If patients previously sensitized to penicillin by local application drink milk containing penicillin, dermatitis may develop and persist indefinitely if its true nature is not recognized. The authors recently saw 2 patients in whom penicillin in milk seems to have been the cause of dermatitis.

The first patient, now 55 years old, at age 20 had had dermatitis due to contact with dyed fur. At age 45 a rash developed on her ears after contact with a pig with scaling ears; treatment with penicillin resulted in severe dermatitis of the ears, and the rash spread to the face and neck. At age 49, a rash developed on her hands. Allergy tests were all negative, but thereafter she had recurrent attacks of dermatitis affecting particularly the face and hands. She came to the outpatient department in August, 1957, when she had acute dermatitis, with erythema and weeping, of the face, neck, and back of the hands and forearms. Patch tests disclosed strongly positive reactions to penicillin. A more detailed history revealed that this patient had lived on farms for many years. When she obtained milk from her own cow (which had not had penicillin), she was well, but when the cow stopped lactating and milk, probably containing penicillin, was obtained from another source, she had a relapse. Her previous attacks had been associated with drinking milk, for she improved when away from the farm. Analysis of fresh milk from the farm where she lived showed a penicillin content of 4 units per milliliter. She was densensitized to penicillin and now tolerates 1 million units with no ill-effects. The second patient, a farmer, aged 44 years, admitted giving his cows penicillin for mastitis and drinking the milk. Patch tests were positive in reaction to procaine penicillin. The authors suggest that the American ruling, prohibiting the sale of milk from cattle for 72 hours after the last injection of penicillin, should be adopted in Britain.

UROLOGY

Transposition of External Genitalia in a Case with Fanconi Type Deformity. B. S. Chappell. J. Urol. 79:115-118 (Jan.) 1958 [Baltimore].

The author reports the case of a child who was first seen on urologic consultation at the age of 6 weeks. Examination showed multiple congenital anomalies. The right forearm was absent; there were shortening and deformity of the left forearm; the legs were bowed; and x-ray examination of the skeletal system revealed absence of a number of bones. Examination of the external genitalia showed a scrotum lying above the penis. There was some hypospadias with mild downward curvature. In the midline of the perineum and behind the penis, there was a shallow, bluish depression, suggesting the possibility that a vagina might be present below the skin at this level. The hemoglobin level, red blood cell count, white blood cell count, and platelet count were below normal. Bleeding from a puncture in the ear lobe lasted more than 24 hours and was controlled with considerable difficulty. Sternal puncture was not thought advisable because of this severe bleeding tendency. The scheduled plastic surgery on the external genitalia was canceled. There has been a strong familial tendency toward skeletal deformities in this child's family, but the main purpose in reporting this case has been to bring to the attention of urologists the coexistence of congenital pancytopenia, Fanconi type, and anomalies of the external genitalia and, more particularly, to call to their attention the dangerous bleeding tendencies present in the Fanconi type of deformity. A search should be made for congenital pancytopenia (Fanconi type) with its dangerous bleeding tendencies, when surgery is planned on congenital anomalies of the external genitalia.

Torsion of the Spermatic Cord. H. D. Woodson, A. L. Herring and R. D. Mynatt. J. Urol. 79:127-133 (Jan.) 1958 [Baltimore].

Ten patients with torsion of the spermatic cord were observed by the authors in the course of 6 years. All had been seen by their family physician prior to referral. The time elapsing between onset of pain and surgery or manipulation varied from 1 hour to 3 days in the 9 acute cases; the time lapse was 7 years in the 1 case which was classified as recurrent. In 4 of the acute cases the first diagnosis was epididymitis. The history in each case was similar: there was a sudden onset of testicular pain which was persistent. Physical findings were uniform: there was a painful testicular mass, and any manipulation accentuated the pain. Scrotal edema appeared to be a late finding and was closely correlated with hemorrhagic infarction. Laboratory studies were of little value other than ruling out inflammatory conditions. Two of the 9 patients in whom the condition was acute were relieved by external manipulation. Surgical exploration in the other 7 confirmed the preoperative impression of acute torsion of the spermatic cord. In four of these patients hemorrhagic infarction necessitating orchiectomy had already developed, and in 3 patients the organ was viable after relieving the torsion. The patient with recurring torsion was relieved by orchiopexy. In all cases where the opposite hemiscrotum was explored, there was a similar congenital malformation which could predispose to torsion. Hemorrhagic infarction did not occur in any case where the time lapse between onset of pain and surgery or external manipulation was less than 5 hours, but 1 testis was conserved where the time lapse was 3 days.

Hemorrhagic Infarct of the Testis in the Newborn. L. H. Tankin and M. A. Robbins. J. Urol. 79:119-126 (Jan.) 1958 [Baltimore].

The authors present the histories of 4 newborn infants with hemorrhagic infarct of the testis, whom they observed in the course of 1 year. This seems to suggest that the condition is more frequent than reports would indicate. In 3 of the 4 infants intrauterine torsion was present, and in the 4th infant the etiology was unknown. There is no clinical differentiation between torsion of the testis and idiopathic hemorrhagic infarction in the newborn infant. Since the end-result is identical in both types, that is, vascular occlusion of the testis with hemorrhagic infarction, one can only be certain if a definite twist of the cord is found at surgery. The severe subjective signs that accompany testicular torsion in older children or adults are absent in the newborn infant, and the first sign is that of an abnormally large testis which is firm to stony hard. The overlying skin of the scrotum is bluish-black in color.

The condition must be differentiated primarily from hematoma of the scrotum due to trauma at birth, hydrocele, and strangulated hernia. Malignant tumor of the testis should be considered when a hard scrotal mass is detected. If tumor is suspected, the infant should be examined for lymphadenopathy and a chest film taken to rule out metastases. The ideal treatment would be early surgical exposure. The testis might be salvaged in case of torsion, if the condition is recognized early. Unfortunately, diagnosis and exploratory procedure have been carried out too late in the majority of cases, and irreversible necrosis has taken place. Microscopic examination in the 4 cases observed by the authors indicated such complete destruction that it cannot be conceived how these testes might be useful. Unilateral atrophy of the testis in adults may be a sequela of undiagnosed testicular infarction of infancy.

THERAPEUTICS

Comparison of Buffered and Unbuffered Acetylsalicylic Acid. R. C. Batterman. New England J. Med. 258:213-219 (Jan. 30) 1958 [Boston].

The author presents new data on the following questions: What is the likelihood of encountering gastrointestinal intolerance when acetylsalicylic acid is used alone according to usual clinical practice? How effective are the relatively small quantities of antacids that can be incorporated in a 0.3-Gm. (5-grain) acetylsalicylic acid tablet in preventing or decreasing any gastrointestinal intolerance to aspirin? Do such quantities of antacids alter in man the absorption and excretion of salicylates so as to influence the clinical effectiveness in terms of rapidity and degree of analgesia? What are the analgesic effectiveness and the gastrointestinal tolerance for a rapidly disintegrating unbuffered 0.3-Gm. (5-grain) tablet and a buffered 0.3-Gm. (5-grain) tablet containing small amounts of dihydroxyaluminum aminoacetate and magnesium carbonate (Bufferin) and supplied as identical-appearing tablets labeled "analgesic tablet C" and "analgesic tablet D"? The code for these tablets was made known only after the completion and analysis of the studies, so that their differences were completely unknown to all investigators, the staff, and the patients until after the data had been tabulated and the conclusions drawn.

Since evaluation of any analgesic agent should consider both ambulatory and hospitalized patients, both types were included. Furthermore, the results of medication should be studied from single doses, from repeated doses given for 1 or several days, and from chronic administration for several weeks or longer. Therefore, 160 patients in all, divided into 4 groups, were given the buffered or the unbuffered drug or both. The hospitalized patients were on the medical, surgical, and specialty wards of a hospital for acute and chronic diseases, and the ambulatory patients were treated in the arthritis and medical clinics of 2 hospitals. In none of the 4 types of comparisons used was it possible to distinguish between the medicaments for analgesic effectiveness or for gastrointestinal tolerance. The time required to produce analgesia, the degree of analgesia, and the frequency of gastrointestinal intolerance were identical for both preparations. A similar study utilizing the single-blind method produced the same conclusions. Although sodium bicarbonate might delay the absorption of salicylate, the buffering antacids exemplified by aluminum compounds do not alter the rapidity of absorption of salicylate from the gastrointestinal tract of man. It is, therefore, concluded that these antacids serve no useful purpose as constitutents of the tablets studied and that inclusion of them with acetylsalicylic acid offers no advantage over aspirin alone.

Laboratory and Clinical Studies with Buffered and Nonbuffered Acetylsalicylic Acid. G. A. Cronk. New England J. Med. 258:219-221 (Jan. 30) 1958 [Boston].

This study was designed to examine the relative efficiency or deficiency of buffered and nonbuffered acetylsalicylic acid as a pharmaceutical agent. Two basic drug preparations were used. The first was a commercial buffered preparation purchased on the open market and then repackaged in containers marked "container A" and "container D." The second preparation was made from bulk acetylsalicylic acid to which starch had been added to increase the bulk of the preparation. The acetylsalicylic acid thus increased in bulk was then pressed with a die, resulting in a tablet grossly indistinguishable from the buffered drug and containing 0.3 Gm. of acetylsalicylic acid per tablet. These latter tablets were coded "tablet B" and "tablet C." The 2 agents were packaged in an outside facility, and the code identification was not revealed until the project was completed. Blood salicylic acid curves were determined in a cross-over study in 20 healthy volunteers after the administration of 0.6 Gm. of buffered and nonbuffered acetylsalicylic acid. Blood samples were obtained at 0, 10, 20, and 60 minutes. The average blood salicylic acid levels after administration of buffered acetylsalicylic acid were 0, 0.9, 1.8, 2.3, and 2.8 mg. per 100 ml. The average levels after administration of nonbuffered acetylsalicylic acid were 0, 0.9, 1.9, 2.2, and 2.8 mg. per 100 ml.

In a double-blind study, 667 doses of nonbuffered acetylsalicylic acid (0.6 Gm.) and 757 doses (0.6 Gm.) of buffered acetylsalicylic acid were administered to patients hospitalized with painful conditions. No statistical difference was demonstrated between the 2 agents studied in the time required for relief of pain, the duration of the relief, or the degree of relief. Approximately 30% of the patients in both groups failed to experience relief of discomfort. Gastrointestinal symptoms followed the administration of buffered acetylsalicylic acid in 3 patients (0.4%) and the administration of nonbuffered acetylsalicylic acid in 5 patients (0.7%). In all of these 8 patients, buffered and nonbuffered acetylsalicylic acid was administered on subsequent occasions without the occurrence of gastrointestinal symptoms, suggesting that the underlying disease affected the production of these symptoms.

Use of Mecamylamine in Treatment of Arterial Hypertension. E. Manzini, A. Morini and C. Paltrinieri. Minerva med. 48:4028-4031 (Nov. 28) 1957 (In Italian) [Turin, Italy].

Mecamylamine was given to 20 patients with arterial hypertension, most of whom had had the arteriosclerotic type for a period of about a month. The group was composed of 16 women and 4 men, ranging in age from 49 to 80 years. The initial dose of 2.5 to 5 mg. was given twice daily by mouth and was gradually increased. Most of the patients responded to the average daily dose of 20 to 30 mg. The drug was also administered to a control group of 5 persons. Supine blood pressure response was slight and erratic; in this position tachycardia was noted in some patients and bradycardia in the others. Tachycardia was always noted in patients in standing position. Hypotensive effect was observed within a few hours after the drug administration. The greatest fall in blood pressure occurred within 5 to 8 hours, which level persisted for a period of 12 to 24 hours. The supine systolic blood pressure was reduced, on the average, by 20% and the supine diastolic blood pressure by 16%. The fall in blood pressure in standing position varied between 23% for the maximum pressure and 20% for the minimum pressure. The patients who had not previously received other ganglionic blocking drugs responded better to mecamylamine than did those who had. Several patients developed untoward side-effects. Two of the 5 persons in the control group showed a state of anxiety, which led to withdrawal of the drug in 1. Dizziness and mental symptoms were a common complaint among the patients; some of them were so disabled that it was necessary to discontinue the medication. Troublesome gastrointestinal symptoms were also observed in some instances.

The authors consider mecamylamine to be a useful agent in the treatment of hypertensive disease. Its therapeutic advantage over drugs with similar ganglionic effects consists mainly in the administration by mouth, which gives a more stable and longer duration of action. In comparison with other ganglionic blocking agents, mecamylamine causes more intense untoward side-effects.

The Treatment of Hepatolenticular Degeneration with Penicillamine, with a Report of Two Cases. W. P. Fister, J. E. Boulding and R. A. Baker. Canad. M. A. J. 78:99-102 (Jan. 15) 1958 [Toronto].

The authors present a report on two patients with hepatolenticular degeneration. One patient has been under treatment for 4 years. Treatment of this patient first with dimercaprol (BAL) and then with Calcium Versenate is described and contrasted with the more successful treatment of the other patient with penicillamine. The better results with penicillamine are felt to be due to its ability to cause a greater diuresis of copper than either or both of the other agents. The steady improvement of the patient treated with penicillamine paralleled his degree of negative copper balance. The penicillamine used was made from penicillin. The authors also studied the effect of L-penicillamine and racemic or DL-penicillamine, all as the hydrochloride. As regards the copper output in the urine, these 3 substances are apparently identical. The authors feel that penicillamine is more desirable for the treatment of hepatolenticular degeneration than previously available chelating agents. It has the additional advantage of being effective orally. One of the authors had the opportunity to treat a second patient with hepatolenticular degeneration with penicillamine. It is too early to comment on the clinical course, but it is possible to say that the diuresis of copper has been satisfactory.

Chlorpromazine as Masking Agent in Intestinal Obstruction. D. A. Barnett. J. Oklahoma M. A. 51:16-17 (Jan.) 1958 [Oklahoma City].

The author describes experimental studies on dogs to ascertain the effect of chlorpromazine on the intact small intestine and on high intestinal obstructions. Chlorpromazine has no consistent effect on the motility of the intestine, its effects being on the chemoreceptor trigger zone in the diencephalon. It significantly delays the onset of vomiting in complete high intestinal obstruction, and it decreases the total vomitus in intestinal obstruction. Chlorpromazine does not lengthen the survival time in intestinal obstruction; thus, it is a masking agent in such obstruction. It is known that chlorpromazine is a potent and effective antemetic in many conditions, but, like other good drugs, it can be abused. Chlorpromazine has been used all too frequently symptomatically in the treatment of vomiting without determining the underlying cause. When intestinal obstruction is present, operation could be delayed to the point of irreversibility.

Oral Treatment with Tolbutamide. S. Aarseth. Tidsskr. norske lægefor. 77:1135-1139 (Dec. 15) 1957 (In Norwegian) [Oslo].

Unlike carbutamide (BZ 55), tolbutamide (D 860) is not a sulfanilamide derivative. Peroral treatment with tolbutamide is not effective in patients with absolute deficiency diabetes or with acidosis or in coma. It can control the diabetic symptoms in patients with mild to moderate diabetes of the so-called stable type, without complications, which cannot be regulated satisfactorily by diet alone. It may be considered for patients in whom diabetes has developed after the age of 30 to 40 years and who do not require large amounts of insulin. It is rarely of value in patients under 20. From 60 to 80% of diabetic patients over 60 will react satisfactorily to it, because their diabetes is due to deficient utilization of, or increased need for, insulin. The last-named type of diabetes can pass into a genuine insulin deficiency diabetes, and not a few older patients will therefore be refractory to tolbutamide treatment. Overweight diabetics in this age group must first be given dietetic treatment, and tolbutamide should be tried only if, in spite of restricted diet and eventual loss of weight, considerable hyperglycemia and glycosuria continue. Tolbutamide treatment is contraindicated for patients with unstable diabetes which is difficult to regulate satisfactorily by any means. To start or to continue tolbutamide treatment in patients with ketonuria or acidosis or in coma is contraindicated. The treatment is contraindicated in acute aggravation of diabetes due to different forms of stress and in at least the second half of pregnancy, also in hepatic disease, renal insufficiency, and diseases of the thyroid. Long-continued tolbutamide treatment should not be instituted in persons who cannot or will not cooperate.

Diabetics treated with tolbutamide must be carefully instructed and must be under regular medical supervision. The physician must impress on the patients the necessity for strict observance of the diet. Tolbutamide is low in toxicity. Side-effects occur in at most 3% of those treated. The most serious side-effect to date has been hypoglycemia, especially in the transition from insulin to tolbutamide. If allergic manifestations appear, tolbutamide must be withdrawn at once and insulin substituted. Carbutamide should no longer be applied. On tolbutamide treatment, 3 Gm. (6 tablets) are given the first day, after which the dose is reduced by 0.5 Gm. (1 tablet) daily down to 1 Gm. (2 tablets), which is in most cases a suitable maintenance dose. If the patient has been treated with insulin, the insulin should not be withdrawn suddenly. On satisfactory response, the effect is usually seen during the first days, and, as a rule, a test period of 1 week will suffice. Patients treated with tolbutamide, particularly those previously treated with insulin, must be under close supervision during the test period. Treatment with tolbutamide should be continuous; intermittent treatment increases the chance of hypersensitivity reactions. It is still too early to know the long-range significance of tolbutamide. Its only advantage over insulin is that it can be taken by mouth. Insulin therapy is the only physiological substitution therapy indispensable in all diabetic complications.

Anaphylactic Reaction: A Violent Reaction to Topical Penicillin. C. A. Nystrom. J. Kansas M. Soc. 59:7 (Jan.) 1958 [Topeka].

A 67-year-old woman noticed a sore area in her mouth. She broke up a penicillin tablet and placed one-fourth of it on the raw area. Almost immediately her lip began to swell, and she complained of an increasing numbness in her legs. She felt cold, sweaty, and faint. On her way to the clinic by automobile, she complained of difficulty with her vision. On arrival at the clinic, 4 or 5 minutes later, she fainted. Her blood pressure was unobtainable; her heartbeat was regular, although faint to auscultation. Her skin was wet and clammy. She could not be roused by strong stimuli. The patient was given Solu-Cortef, 100 mg. intravenously, at 1:35 p. m.; epinephrine, 0.5 cc. subcutaneously, at 1:40; Benadryl, 5 cc. intramuscularly, and epinephrine, 0.3 cc. subcutaneously, at 2:15; Solu-Cortef, 100 mg. intravenously, and epinephrine, 0.3 cc. subcutaneously, at 2:30. Her blood pressure was unobtainable during all this time, and her breathing was shallow. She did not respond to her name or to painful stimuli until 2:45 p. m. At that time her breathing improved, and her blood pressure was 90/65 mm. Hg. The patient was given several doses of Solu-Cortef during the next 9 hours and recovered.

Phenylbutazone (Butazolidin) in the Treatment of Thrombophlebitis. R. Castagna and C. Mairano. Minerva med. 48:3915-3917 (Nov. 21) 1957 (In Italian) [Turin, Italy].

Phenylbutazone was used in the treatment of thrombophlebitis in 115 patients, 103 of whom had the superficial and 12 the deep venous thrombophlebitis of arms and legs. Patients with hepatic and renal insufficiency were not included in this series. Phenylbutazone was given orally to the patients with the mild forms of the disease, orally or intramuscularly to the patients with medium-severe forms, and intramuscularly to those with severe forms of the disease. The daily oral dose varied from 400 to 800 mg. and the daily intramuscular dose from 600 mg. to 1.2 Gm. Mild forms of the disease were present in 65 patients. Excellent results were observed in 45 patients (70%), good results in the rest. Twenty-five patients had the medium-severe form of the disease. Good results were observed in 15 patients (60%), fair results in the others. The earliest response to treatment was manifested by a decrease in pain, and this was apparent after the 1st injection or 12 hours later. Objective symptoms (fever, inflammation) subsided completely within 2 to 3 days of the treatment. Patients with a severe type of the disease were given phenylbutazone in combination with ethyl biscoumacetate. The results were good in almost all patients. Pain disappeared within 12 to 24 hours, resolution of phlebitic and periphlebitic inflammations took place within 2 to 3 days, and swelling of the lymph nodes disappeared within 8 to 10 days. It seems that the drug exercised a prophylactic action in cases of severe lesions by anticipating new inflammatory processes in local or in adjacent areas.

Beneficial effects from the administration of phenylbutazone were obtained in 5 patients with migratory thrombophlebitis, associated with thromboangiitis obliterans. The combined therapy of phenylbutazone with an anticoagulant was also effective in patients with deep venous thrombophlebitis of the legs, in 11 of whom the lesion developed in the postoperative state and in 1 without an apparent reason. The first response to the drug was decrease in pain, followed by considerable retrogression both of edema and of fever within 1 to 4 days. Phenylbutazone is a valuable drug in the treatment of thrombophlebitis due to its anti-inflammatory, analgesic, and antipyretic qualities rather than its causal and prophylactic properties.

Therapeutic Results Obtained in 111 Patients with Tuberculous Empyema Treated with Various Drugs. M. Serembe and M. Majetti. Minerva med. 48:3918-3923 (Nov. 21) 1957 (In Italian) [Turin, Italy].

The authors describe the results of various chemotherapeutic regimens in treating 111 hospitalized patients with tuberculous empyema, in 27 of whom the clinical disease had not been manifest for longer than 12 months. Treatment consisted in withdrawal of the empyema fluid and in rinsing with a physiological solution, followed by administration of the drugs. The following were the daily dosages in the administration of a single drug: 500 mg. of streptomycin given intramuscularly in 2 divided doses to 12 patients, 10 to 12 Gm. of aminosalicylic acid given orally in divided doses to

10 patients, 250 to 350 mg. of isonicotinic acid hydrazide given orally in 5 divided doses to 10 patients, and 250 mg. of oxytetracycline given intrapleurally to 9 patients. The first 3 groups of patients have received in addition the same drug administered intrapleurally. Complete recovery or substantial improvement in descending order of efficacy was as follows: 5 patients (50%) in the isonicotinic acid hydrazide group, 4 patients (44%) in the oxytetracycline group, 4 patients (40%) in the aminosalicylic acid group, and 4 patients (33%) in the streptomycin group.

Three groups of patients received different combined chemotherapies. The combination streptomycin-aminosalicylic acid was given to 14 patients. Streptomycin was administered intramuscularly in daily dose of 500 mg. and aminosalicylic acid orally in daily dose of 10 to 12 Gm. The combination dihydrostreptomycin-isonicotinic acid hydrazide was given to 8 patients. Dihydrostreptomycin was administered intramuscularly in daily dose of 500 mg. and isonicotinic acid hydrazide orally in daily dose of 250 to 350 mg. The combination dihydrostreptomycin-aminosalicylic acid-isonicotinic acid-hydrazide was given to 10 patients. Dihydrostreptomycin alone was administered intramuscularly in the daily dose of 300 mg. and orally in combination with isonicotinic acid hydrazide in daily doses of 250 to 350 mg. The combined drugs were also administered intrapleurally, each one containing a dilution of the respective 2 or 3 drugs in a physiological solution. Complete recovery or substantial improvement, in descending order of efficacy, was as follows: 7 patients (70%) in the dihydrostreptomycin-aminosalicylic acid-isonicotinic acid hydrazide group, 9 patients (57%) in the streptomycin-aminosalicylic acid group, and 4 patients (50%) in the dihydrostreptomycin-isonicotinic acid hydrazide group. The best results were obtained in patients with closed empyema, even if the disease was accompanied by fever, provided that the morbidity was of recent date. Poor results were obtained in patients with chronic empyema or in those in whom a persistent bronchopleural fistula was present.

PATHOLOGY

Duodenal Ulcer as an Etiologic Factor in Gastric Ulceration. J. D. Ballard and J. T. Payne. Northwest Med. 57:193-196 (Feb.) 1958 [Seattle].

The authors report on 59 men, between the ages of 26 and 77 years, with gastric ulcer. Nineteen of the 59 patients had an acute gastric ulcer in association with another illness and, therefore, were considered as having stress ulceration. Twenty patients had a chronic gastric ulcer without any other disease and without a duodenal ulcer or scarring. The remaining 20 patients had a duodenal ulcer or deformity in association with the gastric ulcer. All gastric ulcers were diagnosed by x-ray, except 3 which were detected at surgical intervention or at autopsy. All were ulcers of the lesser curvature. All duodenal ulcers or deformities were diagnosed by x-ray at surgery or autopsy. There were 16 patients between the ages of 16 and 50 years, and 8 of these (50%) had associated duodenal ulcer deformity. Of the 43 patients over 50 years of age, 15 had an associated acute illness; after this stress group had been eliminated, 28 patients remained, and 11 of these (40%) had associated duodenal ulcer deformity. These findings suggest that duodenal malfunction plays a role in the genesis of gastric ulcer and that, in patients in whom the 2 lesions coexist, medical treatment may be doomed to failure. Gastric ulcer associated with duodenal deformity may best be treated by gastric resection or by some adequate physiological procedure or altering procedure or both and, in addition, by gastric drainage.

Sinus Histiocytosis of Lymph Nodes in Cancer. M. M. Black and F. D. Speer. Surg. Gynec. & Obst. 106:163-175 (Feb.) 1958 [Chicago.]

The authors have been interested in the relationship between the survival of cancer patients and the various structural features of their primary cancer and the regional lymph nodes. The lymph node features which were studied included follicular prominence, sinusoidal structure, and the cellular pattern of the pulp. When it was found that cancer patients with a marked degree of sinus histiocytosis of the regional lymph nodes had prolonged survivals, it was assumed that sinus histiocytosis might have prognostic significance. A study was made of the occurrence of sinus histiocytosis in lymph nodes removed from patients with and without cancer. Within the cancer group the relationship between sinus histiocytosis and survival was studied in regard to its dependence upon regional node metastases and the differentiation of the primary tumor. The data obtained would seem to justify the following conclusions: 1. Sinus histiocytosis is an uncommon finding in the lymph nodes of cancer-free humans, rats, and mice. 2. Sinus histiocytosis is more properly considered as representing a reactive change of lymph nodes than as a variant of the normal nodal structure. 3. Sinus histiocytosis of the regional lymph nodes is greater in patients with breast and gastric cancer, who subsequently survive for prolonged periods of time, than in those who die of the disease within three years after the operation. 4. The survival of cancer patients with sinus histiocytosis is greater than the survival of similar patients without sinus histiocytosis. 5. The favorable prognostic significance of sinus histiocytosis is not dependent upon the presence or absence or amount source of the strains and the technical performance of the method, as well as the interpretation of the results. Whatever method one chooses, a practical typing or, at least, screening of the strains can generally be achieved, if every technical step is thoroughly standardized and the interpretation critically considered in the light of experience gained by investigations of epidemiologically well-defined strains. The combined use of the 3 methods gave results considerably more sensitive and more specific than did any one of them.

Acute Benign Granulocytopenia as an Immunologic Reaction. A. Gentile and G. Gelli. Minerva pediat. 9:1389-1393 (Nov. 24) 1957 (In Italian) [Turin, Italy].

The authors report on a 4-month-old male infant, whose diagnosis on admission to the hospital was neutropenia associated with lymphocytosis. A month before admission the infant had received chloramphenicol for pharyngitis accompanied by fever. He had a short period of prostration a week before admission, which symptom recurred the following day. Enlarged spleen and liver on palpation and occult blood in the feces were found on admission. On the 7th hospital day combined therapy with prednisone (daily dose of 25 mg.) and vitamins was instituted. The size of the enlarged spleen had decreased after 7 days. The white blood cell count of 4,000 per cubic millimeter, rose to 10,000, and the value of 2.8% neutrophils in the differential marrow count rose to 5.6% within 10 days of medication with prednisone. The patient was soon discharged, and a reduced daily dose of 12 mg. of prednisone was prescribed. Since then he has been seen regularly in the outpatient department at 2-week intervals or more and has generally been well. Slight enlargements of the spleen and liver, accompanied by mild fever and occasional vomiting, have persisted, however. Prednisone therapy was discontinued 2 weeks after discharge from the hospital. The last recorded values of the white blood cells varied between 8,200 and 11,800 per cubic millimeter.

The authors discuss 3 possible etiological factors in this case of granulocytopenia. One possibility is the influence of the chloramphenicol therapy given a month before admission to the hospital. The second possibility is the direct action of an undetected viral infection on granulocytopoiesis. The third and most plausible possibility is the presence of a peripheral mechanism, marked by a marrow activation process and by the presence of anti-erythrocytic autoantibodies (not accompanied by symptoms of hemolytic anemia), followed by the appearance of leukoagglutinins. Although the last possibility of this case, which is an immunological one, has not been rigorously proved, yet it indicates the existence of an acute idiopathic granulocytopenia as a clinical entity characterized by few symptoms and a favorable prognosis.

Massive Occlusion of the Main Pulmonary Artery and Primary Branches: Case Report. J. M. Leinassar and N. R. Niles. Circulation 17:60-64 (Jan.) 1958 [New York].

The authors report a case of a massive occlusion of the main pulmonary artery and its major branches, on the right and on the left, in a 40-year-old man who early in 1950 had suffered sudden chest pain and hemoptysis and later had 5 or 6 similar attacks in 1951. At the latter time he was given digitalis because of extrasystoles. In October, 1954, recurrent ulcers of the left leg were treated by stripping of a vein of the upper leg. The cardiopulmonary disease and the syndrome of pulmonary artery obstruction remained undetected, although a chest roentgenogram as early as 1951 had revealed pulmonary densities and prominent hilar shadows. Blood pressure varied between 80/50 mm. and 100/70 mm. Hg. Before the patient's death in March, 1956, the hemoglobin level was 18.2 Gm. per 100 cc., and the hematocrit was 59. Autopsy revealed a single, huge, old, laminated, thrombotic pulmonary embolus involving the main pulmonary artery and its primary branches; the proximal end was just 1 cm. above the pulmonic valve ring. At a few points, especially in the distal segment of the main arterial branch on the right, there were softening, friability, and roughening, suggesting that some portions of the thrombus here may have been more recent. A tortuous channel around the thrombus existed from the proximal portion of the pulmonary artery into the periphery of both lungs. In the more peripheral portions of the arterial tree, numerous other thrombotic masses were apparent. Some of these were organized, and at least 1, measuring 6 mm. in diameter and progressing for a distance of approximately 2 cm., was not connected with the main thrombus. There were marked right ventricular and right artrial hypertrophy and dilatation. The heart itself weighed, after fixation, 635 Gm. and measured 12.5 cm. in maximum transverse diameter. There were 2 old, well-healed myocardial infarcts and widespread myocardial fibrosis, without demonstrable coronary artery disease.

Apparently this patient had a tremendous pulmonary embolism in 1950, 6 years before his death, and most, if not all, of the disease resulted from this. There were other similar clinical episodes in 1951, probably as a result of smaller emboli breaking off from the major mass in the pulmonary artery, or possibly as a result of additional thrombosis being superimposed on the original embolus, as suggested by the lamination. When seen early in 1955, the patient had definite evidence of severe chronic cor pulmonale by physical examination, chest roentgenogram, and electrocardiographic study. The 2 old myocardial infarcts and focal myocardial fibrosis may have resulted from anoxemia due to pulmonary vascular obstruction. This is apparently the most massive obstruction of the pulmonary artery of any significant duration recorded in the literature; the patient's survival for 6 years after the initial episode is, therefore, especially surprising and also the longest yet reported. A plea is made for proper causative diagnosis of cor pulmonale as well as for recognition of the syndrome of chronic pulmonary vascular obstruction.

Bilateral Cystosarcoma Phyllodes, Malignant Variant, with 14-Year Followup: A Case Report. T. Reich and C. Solomon. Ann. Surg. 147:39-43 (Jan.) 1958 [Philadelphia].

The incidence of malignant cystosarcoma phyllodes is low. Approximately 30 cases have been reported, and none of the previously reported bilateral cystosarcomas were malignant. The authors report the first case of a bilateral malignant cystosarcoma phyllodes. When 23 years old, this woman presented herself with a lump in the left breast of 6 years' duration. The lump began to enlarge when the patient became pregnant in February, 1942. A well-encapsulated firm mass, 14 by 12 by 8 cm., was excised. In March, 1943, the mass recurred. The skin over the tumor was pink, contained many dilated blue veins, and showed lymphedema. Radical mastectomy was performed. The breast contained many lobulated tumors from 1 to 9 cm. in diameter. On microscopic examination the tumors were seen to be composed of intertwining fascicles of dense spindle cells with elongated nuclei and little cytoplasm. A pathological diagnosis of adenofibrosarcoma was made. In March, 1950, the patient was again admitted to the hospital for removal of an olive-sized mass in the right breast. In June, 1953, after the birth of her third child, a tumor developed in the right breast. A right radical mastectomy was performed. In 1955 the woman was admitted twice for removal of axillary masses. She died early in 1956, and autopsy revealed widespread metastases. Both breasts became involved in association with pregnancy. The metastatic tumor cells were blood-borne, and the lesions had no epithelial elements.

Sarcoma of the Stomach. F. Baldrati and G. Mattioli. Minerva chir. 12:1335-1349 (Nov. 15) 1957 (In Italian) [Turin, Italy].

The authors report on 12 patients, mostly females, with sarcoma of the stomach. Their ages ranged from 23 to 73 years, the average age being 52. All the patients had the infiltrating type of sarcoma; 8 showed ulceration, and 4 had intact mucosa. Four patients had no manifest metastases. There was involvement of the peritoneal, omental, mediastinal, and hepatic regional lymph nodes. A neoplastic lesion of the intestine was found in 1 patient, which the authors consider to have been an independent tumor. Except for a few instances of lymphosarcoma, reticulum cell sarcoma predominated. Epigastric pain of the ulcer type was the most noted symptom. Perforation occurred in 1 patient. The average duration of symptoms before the onset of medical treatment was 4½ months, with variations from 1 to 10 months. The general state of health of the patients was not bad; one-half of them felt fairly well. Laboratory findings were of no help in establishing a preoperative diagnosis of the nature of the tumor.

Two main features were observed in this series: one was the possible multicentric origin of sarcoma of the stomach, such as was seen in the patient who apparently had 2 solitary lesions, 1 in the stomach and one in the intestine; the other was the possible "transformation" from a gastric ulcer into sarcoma. A lymphosarcoma developed in the seat of a postoperative peptic ulcer in a patient who had had the latter lesion for 13 years. The prognosis for sarcoma of the stomach seems to be better than that for carcinoma of the stomach. The treatment is surgery, combined with or replaced by irradiation therapy. Three patients died shortly after the operation. Surgical biopsy was performed for 2 patients, because a surgical operation would have been ineffectual in view of the diffused lesion. Irradiation therapy was given to 2 patients. Four patients died in less than 6 months, 1 died in less than 1 year, 1 died in less than 2 years, and 3 lived for more than 5 years. Exploratory laparotomy is indicated for diagnosis of sarcoma of the stomach in patients with a palpable gastric tumor of recent history.

RADIOLOGY

Hypotonic Duodenography. F. Soria. Rev. Asoc. méd. argent. 71:244-249 (Aug.) 1957 (In Spanish) [Buenos Aires].

The roentgenologic study of the second portion of the duodenum is of importance for the diagnosis of diseases of the pancreas. This portion ordinarily cannot be visualized well, because it does not retain the contrast substance. The author developed a technique for roentgenologic examination of this portion of the duodenum, which he used in the case of more than 700 persons, either normal or with diseases of the pancreas. The technique is described in detail. It consists of the intravenous injection of oxyphenonium (Antrenyl) in doses of 1, 1.5, or 2 cc. according to the body weight of the person under examination (from 154 to 198 lb. [70 to 90 kg.]). Two or 3 minutes after the injection, peristalsis almost stops. Hypotonicity of that portion of the duodenum follows, during which the contrast substance entirely fills the duodenal loop.

The normal picture of duodenography then consists of dilatation of the duodenal loop, thick and parallel plicae circulares, and convexity of the internal border of the duodenal loop toward the median line. The duodenal papilla can be visualized only in cases of hypertonia or hypertrophy of the sphincter of Oddi. The ampulla of Vater is visualized only in extremely rare cases of chronic pancreatitis. Chronic pancreatitis and carcinoma of the pancreas give typical duodenal roentgenograms of diagnostic value. The duodenal changes of chronic pancreatitis seen on the roentgenogram consist of (1) disappearance of the convexity of the internal border of the duodenal loop or transformation of the convexity into concavity, (2) enlargement and rigidity of the duodenal papilla, (3) edema of the internal border of the duodenal loop, and (4) disorganization of the duodenal folds. The roentgen-ray picture of cancer of the pancreas or of the ampullar region consists of (1) normal or shrunken duodenal C, (2) presence of a "mark of depression on the duodenum" from compression of the dilated common bile duct on the region immediately near the bulb, whether the bulb is involved, and (3) complete disorganization of the duodenal folds, which become rigid and the seat of infiltration. In cases of large carcinoma of the head of the pancreas, the duodenal C is enlarged and the duodenal loop is displaced, fixed, and of diminished lumen. The presence of Frostberg's sign of the inverted number 3 is of great diagnostic value for carcinoma of the head of the pancreas. This sign may also appear in recurrent pancreatitis. The technique described by the author is harmless and well tolerated by the patients. It is contraindicated in patients with prostatic disease and with retention of urine.

Treatment of Cancer of the Lung by Interstitial Implantation. E. E. Cliffton, U. K. Henschke and H. H. Selby. Cancer 11:9-17 (Jan.-Feb.) 1958 [Philadelphia].

Many patients with carcinoma of the lung who have exploratory thoracotomies are found to have lesions that are nonresectable. Thoracotomy offers an opportunity to treat the lung cancer by interstitial implantation with radioactive sources. Between 1941 and the end of 1955, 140 patients with cancer of the lung received interstitial radon seed implants at thoracotomy at the Memorial Center for Cancer and Allied Diseases in New York. One hundred twenty-nine of these patients had bronchogenic carcinoma; the other 11 patients included 6 with metastatic carcinoma, 2 with esophageal tumors, 2 with lymphoma, and 1 with a teratoma. Of the 129 patients with bronchogenic carcinoma, 21, or 16%, had resections in addition to implantation at thoracotomy. Results were poor for the 9 patients treated by pneumonectomy and implantation; 4 of these 9 died during or after the operation; the average survival was 4.7 months, and after implantation it was 6.5 months. Results were much better for the group of 12 patients treated by lobectomy and other limited resections; there were only 3 postoperative deaths; the average survival was 17.4 months; the median survival was 7.0 months after implantation. The latter group has included a patient who is living and is well more than 8 years after implantation.

Results in the 108 patients with bronchogenic carcinoma who received implants without resections at thoracotomy were as follows: operative mortality, 5.6%; average survival, 10.3 months; median survival, 7.0 months after implantation. Slight differences in survival were found among the patients with histologically different tumors who were treated by implantation alone; average survival was 9.6 months for 24 patients with oat-cell carcinomas, 9.8 months for 51 with squamous-cell carcinomas, 11.5 months for 6 with adenocarcinoma, and 10.5 months for 27 with unclassified cancers. Corresponding median survival figures were 7, 8, 12, and 7 months. In the group of 5 patients with superior sulcus tumors treated by implantation without resection, no deaths occurred; the average survival was 27.8 months, and the median survival was 29 months. Good palliation was achieved in every case. One of these patients is living and is well and free of pain 4 years and 8 months after implantation. Radioactive sources for interstitial implantation can be made available much more widely than can radon seeds. Radioactive gold (Au^{198}) and radioactive iridium (Ir^{192}) offer many practical advantages over radon seeds and have been used in most cases for interstitial implantation of lung cancer at the Memorial Center for Cancer and Allied Diseases since January, 1957. In addition, a method for more accurate permanent implantation has been used since January, 1956, with radon seeds and since January, 1957, with Ir^{192} sources.

Evaluation of Roentgenologic Examination of the Breast. R. Dohrmann and R. Labusch. Chirurg. 29:3-6 (Jan.) 1958 (In German) [Berlin].

The essential factor in the roentgenologic examination of the breast is the evaluation of structure and density. In young women the visualization of the glandular structure depends on the amount of fat tissues; the connective tissue fibers are usually readily differentiable. With increasing age the structural outlines disappear, since the fatty tissues increase and the glandular tissues become atrophic. A tumor shadow appears on the roentgenogram at only about one-third of the clinically ascertained size, since in the course of palpation the superimposed layers are included in the estimation. In a carcinoma the shadow is darkest in the center, and the density decreases toward the periphery. There are also cancerous infiltrations in the form of "footlike" extensions. The rapidly growing carcinomas may show diffuse development. Their shadow is not homogeneous; they have irregular outlines, produce thickening and greater density in the connective tissue fibers, and show ray-like extensions into the glandular tissue. Miliary calcium deposits may likewise be present. Retraction of the mammilla is regarded by some as typical of cancer but not by others.

The sclerotic form of mastitis shows fine as well as thickened strands of connective tissue fibers, whereas the cystic form is characterized by numerous rounded, polycyclic changes, which set it off sharply from the surroundings. Some cysts show typical homogeneous shadows, the density of which corresponds to that of connective tissue. Here again coarse granular deposits of calcium may appear. Published reports suggest that, as regards the benign or the malignant character of the lesion, roentgenologic and histological findings coincide in from 85 to 95% of the cases. This relatively good agreement, together with the aversion of some women to physical examination and particularly to surgical intervention, has induced some physicians to base the diagnosis of breast tumor only on the roentgenologic examination. The authors regard this as dangerous, not only because the percentage of diagnostic failure may be higher and effective therapy may come too late, but also because erroneous positive diagnoses may lead to preoperative irradiation, which may interfere with the histological demonstration of a carcinoma.

The authors review the results of roentgenologic studies in 157 women who were referred to the surgical clinic of the Free University of Berlin because of suspected cancer of the breast. This number did not include patients in whom ulcerating tumors or the presence of metastases established the diagnosis of cancer beyond any doubt. Histological studies revealed carcinoma in 117 patients and benign tumors in 40. The roentgenologic diagnosis coincided with the microscopic findings in 136 cases, in 104 of the 117 carcinomas and in 32 of the 40 benign tumors. Thirteen, or 11.1%, of the carcinomas had not been detected by the roentgenogram, and 8, or 20%, of the benign tumors had been mistaken for carcinoma. Three case histories illustrate the difficulties in the roentgenologic diagnosis of breast tumors. While roentgenoscopy revealed a carcinoma in a few instances before it could be detected by palpation, the authors believe that a diagnosis of cancer of the breast should not be based on roentgenoscopy alone. In view of the high incidence of mistaking benign for malignant tumors in roentgenologic examination, they warn against instituting preoperative irradiation without previous histological verification.

Radiodermatitis and Cancer with Regard to 52 Patients, in 12 of Whom Cancer Developed. B Duperrat and R. Andrade. Presse méd. 66:59-62 (Jan. 15) 1958 (In French) [Paris].

The authors, with the collaboration of other hospital services, were able to collect observations on 52 patients with radiodermatitis. The irradiations that led to radiodermatitis were given for 20 different causes. Malignant degeneration developed in 12 of the 52 patients. Ten of these 12 patients had received only roentgen-ray radiation, but 1 of these 10 had been exposed to an additional carcinogenic factor, namely, arsenic. One patient had been treated only with radium and another with radium and roentgenotherapy. Three types of malignant degeneration were observed: spinocellular, basocellular, and sarcoma. The authors comment on the complete absence of malignant melanoma in lesions of radiodermatitis. This seems surprising when it is considered that a pigmented nevus must occasionally be accidentally exposed in an area of radiodermatitis. It is suggested that perhaps the vascular damage accompanying radiodermatitis, as well as the resulting fibrosis or perhaps an inherent quality of the nevus, might explain this.

Malignant degeneration of radiodermatitis was especially frequent in the case of lesions of occupational origin. The age of the patient seemed to play no part, but the latent period between irradiation and malignant degeneration was important. The interval was 25 years in the spinocellular epitheliomas and 30 years in the basocellular lesions and the sarcomas. The tendency to multiplicity of malignant foci was at least twice as great in radiodermatitis as in spontaneous cancers; metastases, however, were of about the same frequency (16%) in both types. Metastases have been relatively rare in the cancers of occupational origin, particularly in recent years. The authors ascribe this to the more effective treatment by excision and grafting. They suggest that in the future this treatment be employed as a prophylactic measure so as to avoid the cancerous degeneration of radiodermatitis.

Parotid Sialography: Roentgenologico-Surgical Correlation in a Series of 70 Cases. R. A. J. Einstein and S. L. Perzik. California Med. 88:98-102 (Feb.) 1958 [San Francisco].

The importance of sialography, the roentgenographic visualization of the ductal system of the parotid gland, was studied in 70 patients with lesions of the parotid, the chief aim being to study the correlation of sialographic, clinical, and surgical observations. The technique of sialography is briefly described. Although there are considerable anatomic variations in the size and shape of normal parotid glands and in the caliber and branching of the ductal system, it is not difficult to establish criteria of normal relationships. The normal appearance is that of a "winter tree" with evenly distributed branches gently tapering toward the periphery. A normal parotid duct is not more than 4 mm. in diameter. Abnormal findings can be grouped as (1) intrinsic space-occupying lesions, (2) extrinsic indenting masses, and (3) abnormalities within the ductal system.

Sialography revealed 36 space-occupying lesions in the superficial lobe of the parotid gland, 14 in the deep lobe, and 3 in the accessory lobes. Two patients had diffusely infiltrating changes, 9 had purely sialangiectatic changes, and in 6 the findings were considered normal. Operations for total or subtotal removal of the parotid were performed on 58 of the 70 patients. The sialographic diagnosis proved correct in 50 of the 58 patients. In 3 cases in which the roentgenologic diagnosis was deep lobe masses, tumors in the pterygoid portion were observed at operation. The tumors were bulky and had an "umbrella" effect. In 4 other cases, the neoplasm was thought to involve the pterygoid and inferior portions but at operation was found to be in the deep lobe. These masses were all located posteriorly. In 1 case in which the roentgenogram was interpreted as normal, a small superficial lymph node within the gland was observed at operation.

The authors conclude that sialography is a useful tool in distinguishing between extrinsic and intrinsic space-occupying masses in the parotid region. It permits differentiation between inflammatory lesions and neoplasms, thus eliminating needless surgical explorations. It alerts the surgeon to masses involving the deep lobe. It can be easily performed and causes little discomfort. Bearing in mind its limitations, sialography is an important diagnostic and preoperative aid in the management of parotid lesions.

The Prevention of Experimental Contrast Medium Injury to the Nervous System. P. D. Kenan, G. T. Tindall, G. Margolis and R. S. Wood. J. Neurosurg. 15:92-95 (Jan.) 1958 [Springfield, Ill.].

The authors believe that there is probably no known contrast agent that is not capable of producing a necrotizing lesion if it reaches the vascular bed of an organ in the mainstream of its flow in a concentration approaching the high initial level required for angiography. They list the theoretical approaches that have been explored and the various agents and procedures used in seeking a protective mechanism against contrast medium injury. In animal experiments with various protective agents, the contrast medium, sodium acetrizoate (Urokon), was injected into the aorta via a retrograde femoral artery catheter. All agents to be tested were administered through the catheter prior to the injection of Urokon. The experiments emphasized the remarkable protective effect of glucose and procaine against experimental injury to the canine spinal cord.

Mucocele of the Vermiform Appendix with Pseudomyxoma Peritonei: Treatment of Four Cases with Radioactive Colloidal Gold. J. D. Palmer, R. G. Rose and M. N. Lougheed. Canad. J. Surg. 1:142-144 (Jan.) 1958 [Toronto].

This is a preliminary report of a long-term program attempting to evaluate the possible usefulness of radioactive gold (Au^{198}) as an adjunct to surgery and x-irradiation in the management of pseudomyxoma peritonei secondary to mucocele of the appendix. Forty-five cases of mucocele have been diagnosed at the Montreal General Hospital since 1925, 8 of them since 1945, in 4,905 consecutive appendectomies. In 5 patients pseudomyxoma peritonei developed, and 3 of these patients were treated with Au^{198} additionally. The histories of these 3 patients and of a 4th patient treated at the University of Texas Tumor Institute are presented. Observations on these 4 patients confirm the value of irradiation and suggest that radioactive colloidal gold can retard the rate of reaccumulation in patients with pseudomyxoma peritonei and is, therefore, a useful addition to standard methods of therapy.

Failure of the radioactive gold therapy in 1 patient may have been related to the fact that the appendix was not removed and that the pseudomyxomatous material was not thoroughly "cleaned out" at the 2 operations. Since the maximum penetration of the beta particles from Au^{198} is less than 4 mm., it is essential that the abdominal cavity be carefully and completely cleared of the mucoid material and the numerous cysts broken down before colloidal gold therapy is given. The tumor cells are relatively scanty and are well surrounded by the pseudomyxomatous material; thus, they will be protected from the beta particles unless surgical clean-out is as complete as possible. The authors feel that the most promising application of radioactive gold therapy is its routine use postoperatively to prevent the possible development of pseudomyxoma peritonei in patients in whom a mucocele or an ovarian cyst has ruptured before or during surgical removal.

Intervertebral Disk Changes After Diskography. I. Goldie. Acta chir. scandinav. 113:438-439 (No. 6) 1957 (In English) [Stockholm].

Diskography has been found helpful in the diagnosis of rupture of the annulus fibrosus. Contrast medium is injected into the disk, and the extent of the rupture is readily perceptible. French authors have stressed that diskography is not entirely free from complications, in that they have observed necrosis and areas of degeneration in disks subjected to diskography. The author examined 122 surgically removed disks of which 53 had been examined by diskography. The interval between diskography and operation ranged from 1 week to 3 months. The findings at operation in 28 of the 53 diskography cases included not only the usual edema and rupture but also changes believed to derive from the reaction of the contrast material with the disk tissue. These consisted of small drops, refractive to light but anisotropic. The droplets varied in size up to 10 times that of a blood corpuscle and were termed hyaline droplets. They occurred in groups but also singly. They occurred most plentifully in the nucleus pulposus but have also been found in the annulus fibrosus. The remaining 25 disks did not show similar changes. The necrosis and tissue degeneration reported by French authors were not observed.

The droplets were interpreted as being remnants of contrast material. Contrast medium was injected into human cadaver disks, and the same medium was studied also in lumbar disks of living and dead rabbits. The animal experiments agreed with the clinical series in that the droplets were most plentiful in patients operated on 15 to 20 days after diskography, and in the absence of changes in the autopsy series. It is clear, then, that the development of the hyaline droplets is linked with a time factor, which suggests that they are the product of a reaction between the contrast material and the disk tissue. A number of staining methods were used in order to study the composition of the hyaline droplets. From the results of these studies it is believed that the hyaline droplets are composed of chondroitin-sulfuric acid.

ANESTHESIA

Intraglossal Injections in Unconscious Patients: An Alternative to Intravenous Injection. J. Bullough. Lancet 1:80-81 (Jan. 11) 1958 [London].

When veins are inaccessible and a rapid onset of action is required, drugs may be injected into the tongue in unconscious patients. The onset of action takes 45 to 90 seconds. The author describes the method of injection as follows: The needle is inserted via the ventral surface of the tongue, because bleeding on withdrawal of the needle is less common there. The 2 veins on either side of the midline should be avoided. With the patient supine, the tip of his tongue is picked up in a gauze swab between the index finger and thumb of the left hand and drawn out of the mouth. The syringe is held in the right hand, and the needle is inserted directly posteriorly (vertically downwards). Volumes of up to 2 ml. may thus be injected, and provided that a sharp needle, size 16 to 18, is used, bleeding on withdrawal of the needle is uncommon. In anesthetized patients the needle may be left in situ for serial injections, and the intraglossal route may be used for most drugs. Irritating solutions should be avoided, except perhaps as a lifesaving measure. Barbiturates should not be used; nor should solutions of tubocurarine and of phenothiazine derivatives, because a tender lump as big as a pea is left for a week or so. Dimethyltubocurarine iodide, being in aqueous solution, can be used as an alternative to tubocurarine, and gallamine can be used. Pethidine, nalorphine, atropine, and neostigmine can all be used.

The Prevention of Fatal Aspiration During Anesthesia. W. Hugin. German M. Month. 3:22-24 (Jan.) 1958 (In English) [Stuttgart, Germany].

Aspiration of the contents of the stomach occurs frequently in the course of an operation when the patient is under general anesthesia. While it is technically not difficult to prevent aspiration, it is not so easy always to carry out consistently all the precautionary measures. Brief inhalation anesthesia requires the same thorough preparation as prolonged and deep anesthesia. Before an elective surgical intervention it is advisable to give the patient only soup as the evening meal. Water and tea may be taken until midnight; after that time any further intake is no longer permitted. During an emergency operation or in a patient with an obstruction of the digestive tract, it is often difficult to avoid aspiration. The following preanesthetic measures are recommended, particularly for small hospitals without a staff physician who is an expert in administering anesthetics. The stomach should be emptied with the aid of the intravenous administration of apomorphine hydrochloride, an emetic, to which the vomiting center promptly reacts. The initial dose of the drug is 2 mg., and a second injection of 1 or 2 mg. should be given when vomiting starts. Aspiration of gastric juice with the aid of an "indwelling" tube is particularly advisable if only fluid or pulpy contents of the stomach may be expected according to history. In patients in whom emptying of the stomach by vomiting is contraindicated, occlusion of the cardia with the aid of a balloon tube is a reliable method for the prevention of regurgitation and vomiting. Gastric lavage is not recommended, because portions of the irrigation water and food residues may remain in the stomach. If vomiting occurs during anesthesia without endotracheal intubation, the patient's head should be lowered immediately and suction with a wide-lumen catheter should be started. If necessary, suction may be performed with the suction tube directly attached to 1 nostril, while the other nostril is kept closed.

PHYSIOLOGY

Accidental Freezing with Cooling Down to 23.5 C (74.3 F) Followed by Recovery. L. Justin-Besançon, H. Péquignot and J.-P. Etienne. Semaine hôp. 34: 63-69 (Jan. 14) 1958 (In French) [Paris].

The patient was a 49-year-old man who was hospitalized after having been found stretched out nude on the floor of his room. He was unconscious and in deep coma. The skin was a bluish-red and extremely cold; it could not be pleated and gave the impression of being "stuffed." The patient did not react to any stimulation, and there was a spastic miosis of the pupils. The corneal reflexes and the tendon reflexes were abolished, as was also the swallowing reflex. Hypertonia prevented movement of the head and the extremities and made it impossible to study the plantar reflex. Tonic movements of the extremities could be observed at intervals of about 2 minutes. Respiration was regular in rhythm but very slow at a rate of approximately 8 per minute. The radial pulse could not be palpated, nor could arterial tension be ascertained, but the femoral pulse could be felt. Auscultation revealed bradycardia. The rectal temperature was 23.5 C (74.3 F); the cutaneous temperature was 17 C (62.6 F) at the feet and 24 C (75.2 F) at the chest and neck. Rewarming was begun at once with the aid of heat cradles, but at first there was only slight clinical change. About 4 hours after the patient had arrived at the hospital, he was placed for 15 minutes in a warm bath, the temperature of which was maintained between 38 and 35 C (100.4 and 95 F). A temporary improvement was followed by collapse, which could be overcome only with the aid of blood transfusions. Consciousness returned after 24 hours, at which time the rectal temperature had reached 37 C (98.6 F).

In the hours which followed the patient showed signs of delirium tremens and symptoms of pneumonia complicated by serofibrinous pleural effusion. The prognosis remained doubtful for about 6 days. On the second day of the delirium tremens there was a sudden reduction in temperature to below 35 C (95 F), which necessitated the return to warming measures. On the day after that, there were signs of collapse. On the 5th day the patient seemed to recover from the pneumonia, and slowly the signs of delirium tremens subsided. In addition to repeated electrocardiographic records, various biological investigations were carried out as the temperature gradually increased. The following were the most notable abnormalities: at 24 C (75 F) the blood did not clot; at 32.5 C (90.5 F) there was a fall in the hematocrit and in the prothrombin time. Hypoglycemia was evident on the day after the hypothermia. In the weeks which followed the patient was subjected to various biological examinations, which revealed slight disturbance in glycemia and abnormalities in liver function tests, which were probably the result of his addiction to alcohol. Fatty degeneration of the liver was demonstrated by biopsy.

Accidental Deep Hypothermia in Adults: Clinical and Biological Studies. L. Justin-Besançon, H Péquignot and J.-P. Etienne. Semaine hôp. 34:69-83 (Jan. 14) 1958 (In French) [Paris].

The case of deep hypothermia reported in the preceding paper induced the authors to review the literature for similar cases. They found reports of 7 other patients who recovered after accidental deep hypothermia with reduction of temperature to less than 30 C (86 F). Several of these reports date back to the 19th century. In 6 of these 8 patients the lowest temperature reached was below 25 C (77 F), and the lowest in any patient who survived was 18 C (64.4 F). The authors also review 2 cases in which death resulted after hypothermia. Apparently the most frequent causal factor is acute alcoholism. Contrary to what has been generally believed, most authors are not opposed to rapid rewarming of the victim of freezing. Warming with the aid of a warm bath at 40 C (104 F) seems to be advisable. When recovery is obtained, there are usually no unfavorable sequelæ. Many of the biological disturbances that result from deep hypothermia have also been demonstrated in animal experiments. Initially there is often hyperglycemia, but this is frequently followed by hypoglycemia and a tendency to acidosis. Other changes are elevation of the hematocrit and moderate reduction in the volume of plasma, also disturbances in the coagulation process. The electrolytes in the blood and the oxygen content of the blood show only slight disturbances. The mechanism of death from deep hypothermia is still not completely understood.

Observations on the Gastrooesophageal Junction During Swallowing and Drinking. B. Creamer and J. W. Pierce. Lancet 2:1309-1312 (Dec. 28) 1957 [London].

The term "gastroesophageal junction" denotes the area covering the lowest 3 cm. of the esophageal tube and not the exact point of transition from tube to stomach. In the experiments described, simultaneous cineradiography and pressure recordings were made in 10 normal subjects during the passage of barium through the gastroesophageal junction. In the first series of experiments, the subjects were given barium to hold in the mouth and to swallow later when the esophagus was at rest. Under these conditions the barium was held up at the gastroesophageal junction, which slowly opened after a pause. The opening of the junction was accompanied by a fall in pressure in this area. These findings indicate a sphincteric mechanism at the gastroesophageal junction; it appears to be situated in the lowest 2 to 3 cm. of the esophageal tube. The sphincter may be forced open prematurely by a sufficiently high intraesophageal pressure. In the second series of experiments, the subjects were given the same volume of barium to drink from a cup. Under these conditions the barium passed straight through the junction without delay, and, further, the junction appeared widely open as the barium arrived. The act of drinking was preceded by a descent of the diaphragm. These observations indicate that drinking and swallowing are different physiological processes and that the gastroesophageal sphincter is opened earlier in drinking than in swallowing.

PUBLIC HEALTH

Infectious Hepatitis: Report of an Outbreak, Apparently Water-Borne. E. C. Wallace. M. J. Australia 1:101-102 (Jan. 25) 1958 [Sydney].

Twenty students, ranging in age from 17 to 19 years, went on a picnic hike, and 19 of them drank untreated water from a river polluted by a sewage-treatment plant. Because the plant is greatly overloaded, its effluent is of unsatisfactory quality. The effluent, before its entry into the river, is subjected to chlorination but insufficiently, as shown by check tests for residual chlorine and the presence of fecal organisms. Gastrointestinal upset developed in 15 of the 19 students from 2 to 5 days later, and in 6 of these the symptoms of infectious hepatitis, including jaundice, appeared from 26 to 38 days later. Of the 13 students in whom infectious hepatitis did not develop, 5 had symptoms of significant constitutional upset (undue tiredness, headache, nausea, anorexia) 37 to 43 days later. All these 13 students and 1 student whose condition was subsequently diagnosed as infectious hepatitis were given gamma globulin 40 days after drinking the river water. The use of gamma globulin was extended to room contacts of those who drank the water. No secondary cases developed in the college.

Outbreaks of apparently water-borne infectious hepatitis recorded in the literature are discussed by the author. In most of these outbreaks considerable numbers were affected; cases occurred almost simultaneously and ceased to occur when the suspected water supply was no longer used. In some instances the infectious hepatitis outbreak was preceded by gastrointestinal disturbance, as in the present series. In some of the recorded outbreaks the water had been chlorinated. This measure, according to studies conducted by Neefe and others in 1945, would not have been a protection. By treating water known to be infective and feeding it to volunteers, Neefe found that the customary amount of chlorine used in the chlorination of water supplies does not inactivate or attenuate the virus of infectious hepatitis.

Poisoning by Synthetic Insecticides. D. Galigani and R. Melis. Minerva med. 48:3753-3763 (Nov. 10) 1957 (In Italian) [Turin, Italy].

Synthetic insecticides may be toxic to human beings. Poisoning by synthetic insecticides occurs as a result of either eating foodstuff from which the insecticide has not been completely removed or handling insecticides in pest control. The authors report on 3 cases of poisoning which were caused by various commercial preparations of hexachlorocyclohexane. The first patient, a woman 25 years old, on admission to the hospital had a diffuse eczema over the upper and the lower extremities. After a period of improvement, symptoms reappeared in an intensified form. They were caused by the application of a medicated compress, utilizing a preparation of hexachlorocyclohexane in concentration of about 0.15%, on the right thigh for a period of 2½ hours. The second patient, a 57-year-old woman, who had used an insecticidal preparation of hexachlorocyclohexane the day before admission to the hospital, experienced hematuria, a rash over the exposed parts of the body, and considerable exhaustion. Symptoms slowly subsided. The third case comprised 3 members of a family who had eaten raw tomatoes. There was evidence that the tomatoes were contaminated by hexachlorocyclohexane. The patients complained of severe diarrhea, abdominal pain, and vomiting. The 4th member of the family, who had not eaten tomatoes, had no pain.

Diagnosis of poisoning by synthetic insecticides can be made when a patient develops symptoms of organic poisoning; these symptoms manifest themselves in the nervous, digestive, or respiratory system after contact with insecticides and disappear after the patient is no longer exposed to the insecticide. Treatment consists in a thorough elimination of the poison and in instituting measures aimed at relief from symptoms and reinforcement of the body in its effort to eliminate the poison and to restore the normal organic functions.

BOOK REVIEWS

Nuclear Radiation in Food and Agriculture. Edited by W. Ralph Singleton, Miller Professor of Biology, University of Virginia, Charlottesville. Geneva series on peaceful uses of atomic energy. Editor of series: James G. Beckerley. Cloth. $8.50. Pp. 379, with illustrations. D. Van Nostrand Company, Inc., 120 Alexander St., Princeton, N. J.; 257 Fourth Ave., New York 10; D. Van Nostrand Company, Ltd., 358 Kensington High St., London, W. 14, England; 25 Hollinger Rd., Toronto 16, Canada, 1958.

The substance of this book is taken from the conference on peaceful uses of atomic energy in Geneva in 1955. The concentration is on agriculture, photosynthesis, and plant physiology and pathology, with special attention to the use of radioisotopes in research and the genetic and biological hazards of nuclear radiation. The discussion of the control of trichinosis by radiation, in the section on food sterilization, suggests a technique for controlling the world-wide problem of all food-borne helminthiases. Details are also given of the experimental study resulting in the complete elimination of the screw-worm fly in Curaçao, Netherlands Antilles, by releasing gamma-ray sterilized male flies among the natural population. The authors of the original papers include well-known workers from the East and the West. The editor has rearranged, annotated, and condensed the reports, but this volume constitutes a fundamental reference work in its special area.

General Diagnosis and Therapy of Skin Diseases: An troduction to Dermatology for Students and Physicians. By Hermann Werner Siemens, M.D., Professor of Skin and Venereal Diseases at University of Leiden, Holland. Translated from German edition by Kurt Wiener, M.D., Dermatologist, Mount Sinai Hospital, Milwaukee, Wis. Cloth. $10. Pp. 324, with 375 illustrations. University of Chicago Press, 5750 Ellis Ave., Chicago 37; Cambridge University Press, Bentley House, 200 Euston Rd., London, N.W.1, England; University of Toronto Press, Toronto 5, Canada, 1958.

In 1952, the author, in the preface to the German edition of his book, stated that the only excuse for a new textbook on dermatology would be a new approach to teaching dermatology. In this textbook he has fulfilled this requirement. The viewpoints and organizations, the topics and sequence of chapters, and the distribution and use of the photographs and drawings all show a fresh and original approach. No other book so clearly demonstrates just what constitutes and distinguishes the specialty of dermatology, what differentiates it from all other specialties, and what special knowledge, skills, and techniques are required by its practitioners. English-speaking persons interested in this specialty should be grateful not only to the author but also to Dr. Kurt Wiener and his associates for their fine translation of this book. It does not pretend to be a complete textbook on dermatology. It does not present a nomenclature or classification of skin disease nor include systematic descriptions of dermatological entities and a discussion of their diagnosis and management, but it does discuss practical principles. The first section is an anatomic and histopathological introduction which gives one of the most concise and accurate accounts of the anatomy of the skin that one could possibly compress into such a small space. Then follows a section entitled "General Diagnosis," which covers (1) color; (2) lesions; (3) extent, shape, and distribution of a dermatosis; (4) changes in the skin appendages; (5) systemic symptoms; (6) subjective symptoms and history; and (7) auxilliary diagnostic techniques.

The chapter on lesions is the most precise and complete account of the primary and secondary skin changes available in English. The black and white illustrations in this chapter are well chosen and show how much can be done, without color, by good photography, intelligent selection of subjects, the necessary close-ups and lighting arrangements, logical juxtapositions, and appropriate legends. In the division on changes in the appendages (mainly the hair and the nails) the same holds true. No one who has looked at the photographs of psoriatic nails (page 176), spoon nails (page 177), or onychogryphotic nails (page 180) would ever fail to recognize a typical case of such ungual disorders when encountering it in a patient. The chapter on systemic symptoms, while brief and not by any means complete, presents a sane and matter of fact analysis of many questions dealing with the relationship between skin diseases and disorders of other organs and systems, including the psyche. The same analytic soundness and saneness pervades the chapters on therapy. Thus, scientific principles of therapy, rather than the details of prescriptions, form the very heart of the chapter entitled "The Administration of the Treatment." This chapter tells precisely how to evaluate topical remedies. In it, both the principles and the details of the use of methods of symmetrical paired comparison and of simultaneous paired comparison of topical medicaments are described, discussed, illustrated, and evaluated. Conclusions are drawn in an objective and scientific fashion. There may still be some doubts in the minds of nondermatologists as to the effectiveness of topical remedies and the manner in which such effectiveness has been or can be proved or disproved. These doubts should be laid permanently to rest by a study of this chapter.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

All in all this extraordinary textbook combines the scholarly background of the author, his lively imagination and original ideas, and his powers of unbiased scientific analysis—an ideal combination in a physician or an author. The practitioner who wishes to attempt the diagnoses and treatment of skin diseases by rote and without thought and logic will find no comfort in this book, but to those who wish to think and to deduce, this book will teach more about dermatology than many of the more pretentious and encyclopedic works. It makes such fascinating reading that even those who are not particularly interested in skin diseases should derive instruction and profit from reading many of the passages that deal with basic concepts and the fundamental methods for arriving at diagnoses and for evaluating the effects of therapy.

The Evolution of Medical Education in the Nineteenth Century. By Charles Newman, M.D., F.R.C.P., Dean of Postgraduate Medical School of London. Cloth. $4.80; 30 shillings. Pp. 340. Oxford University Press, Amen House, Warwick Sq., London, E. C. 4, England; 114 Fifth Ave., New York 11; Amen House, 480 University Ave., Toronto 2, Canada, 1957.

This thoughtful review of medical education in England in the past century is based on the Fitzpatrick Lectures delivered at the Royal College of Physicians by the author. The portrayal of medical education and practice at the beginning of the 19th century serves as a good background for understanding modern developments. In 1800, medical practice and medical education were almost solely concerned with symptoms and their empirical treatment. The difference between educated and uneducated physicians was determined mostly by the presence or absence of knowledge outside of medicine, for neither group possessed any great knowledge of medicine. The author's study of the old London hospitals' records indicates that the importance of physical examination started with Laennec's introduction of the stethoscope in 1819. The evolution of clinical medicine from 1825 to 1850 through correlation of physical findings with the morbid anatomy revealed at autopsy lead the author to observe that medical progress in that quarter century was the equal to that in the contemporary period. With the recognition of physical signs, the emphasis shifted from empirical treatment to disciplined diagnosis and the student's role in the hospital changed from a passive to an active one: he "worked rather than listened, was educated rather than instructed." The predominantly French influence in the move from empirical to clinical medicine provided the groundwork for the transition, under German leadership late in the century, to laboratory medicine. There was an accompanying shift of primary concern from symptoms to what the physician could find and to reports from the laboratory. Much else that transpired during the immediate past century should be of interest not only to medical educators but to all thoughtful physicians. The American reader will suffer little loss by omitting the section dealing with the influence of government legislation.

The Postoperative Chest: Radiographic Considerations after Thoracic Surgery. By Hiram T. Langston, M.D., Chief of Surgery, Chicago State Tuberculosis Sanitarium, Chicago, Anton M. Pantone, M.D., Clinical Assistant Professor of Radiology, University of Illinois College of Medicine, Chicago, and Myron Melamed, M.D., Clinical Assistant Professor of Radiology, University of Illinois College of Medicine. Publication number II, John Alexander Monograph Series on Various Phases of Thoracic Surgery. Memorial to John Alexander (1891-1954), Professor of Surgery, University of Michigan. Editor: John D. Steele, M.D. Editorial Board: Howard T. Barkley, M.D., and others. Cloth. $8. Pp. 228, with 80 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book analyzes the complex shadows seen in the postoperative roentgenogram. It is one of a series of books commemorating the late John Alexander. The material was selected from over 300 cases and is classified as to roentgenographic appearance into the following categories: soft tissues, foreign bodies, ribs, diaphragm, mediastinum, pleural cavity, lungs, and complications. Each illustration is accompanied by an explanatory schematic drawing. The authors recommend a relatively high voltage technique with a stationary grid when possible. The form of presentation is that of an atlas with concise but adequate legends. This book offers a reasonably complete analysis of the chest in postoperative situations as demonstrated on roentgenograms and should be most helpful to physicians interested in chest diseases. It is also recommended to radiologists and thoracic surgeons.

The Human Ear Canal. By Eldon T. Perry, M.D., instructor in Dermatology, Wayne State University, Detroit. Publication number 322, American Lecture Series, monograph in Bannerstone Division of American Lectures in Dermatology. Edited by Arthur C. Curtis, M.D., Chairman, Department of Dermatology and Syphilology, University of Michigan Medical School, Ann Arbor. Cloth. $4.75. Pp. 116, with 40 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1957.

This small book reviews contemporary knowledge of the human external auditory canal from the vantage point of a dermatologist. It presents a succinct summary of the anatomy, physiology, microbiology, bacteriology, and cerumen of the external auditory canal, with a number of pertinent comments on external otitis. The chapter dealing with the treatment of external otitis is sketchy. Despite this failing, the book can be recommended for a quick review of facts pertaining to a structure of interest to dermatologists, otologists, and general practitioners.

QUESTIONS AND ANSWERS

YEAST IN URINE

To the Editor:—*In a woman who complained of pains simulating that with kidney stones and who required morphine for relief, urinalysis revealed 5 pus cells, 2 erythrocytes, few epithelial cells, occasional granular casts, and many yeast cells per high-power field. What is the significance of these yeast cells?*

Alvin H. Seibert, M.D.
Grosse Pointe Park, Mich.

Answer.—Fungi which multiply by budding have no pathological significance; they occur as smooth, highly refractive oval cells that may reach the size of leukocytes, but they are usually smaller. They either are isolated and arranged in rosary-like chains or appear in clumps. Buds in process of constriction are frequently attached to the larger cells. Isolated yeast cells are often found in urine that has been exposed to the air for some time and is undergoing acid fermentation. Yeasts do not thrive in urine free from sugar, but they grow rapidly in urine of persons with diabetes. In such, they appear in large cells, sometimes elongated in the shape of filaments. They may even be present in freshly voided urine. The presence of a large quantity of yeast in urine suggests glycosuria. Yeast cells may be distinguished from leukocytes by the presence of buds, their characteristic outline, a greater refractivity, and the absence of fine granu[illegible] in the nuclei. After the addition of acetic [illegible], the saccharomyces remain unaltered, while leukocytes become more transparent and the nuclei are distinct. The yeast cells may also be carried from the vulva or the vagina into the urine. This patient should have a urine culture and a test for blood sugar done. The finding of yeast cells in the urine has no bearing on the symptoms, except indirectly if the patient should have diabetes.

LACTOBACILLUS ACIDOPHILUS

To the Editor:—*At what pH does the vaginal bacilli, Döderlein bacilli, grow best? What is the lowest pH at which this organism can survive?*

M.D., Texas.

Answer.—It is now believed that the so-called Döderlein bacillus is identical with Lactobacillus acidophilus. Extensive studies have been made with this organism indicating that the optimum pH for its growth is 6. Growth occurs, however, over a range from 4 or lower to 8 or higher. The lowest pH at which this organism can survive has not been well determined but is believed to be in the range of 2. An extensive bibliography will be found in an article by Rosebury (*Arch. Path.* 38:413, 1944).

ENOPHTHALMOS

To the Editor:—*A 40-year-old woman has noticed an increasing recession of both eyes during the past four years. She states that periodically the right eye begins to pain and the eyelid feels heavy while the eye recedes deeper into the socket; on the next day the process ceases in the right eye and begins in the left. A fairly marked bilateral enophthalmos is apparent. There is no apparent ptosis of eyelids; ocular reflexes and movements, retina, peripheral fields, and vision are normal. There is a narrowing of palpebral fissures bilaterally, somewhat more marked on right side. A thorough neurological examination was negative. Blood studies, sinuses, and basal metabolic rate are normal. X-ray of the cervical spine shows a slight subluxation of the fourth cervical vertebra in relation to the fifth. There is no history of any eye injury or infection. Horner's syndrome and myasthenia gravis have been considered, but there does not seem to be enough evidence for either. If this is simply an excessive absorption of ocular fat tissue, what would be the etiology in an individual this young? What further diagnostic measures and what treatment, if any, would be recommended?*

M.D., Ohio.

Answer.—Cases of true enophthalmos are very rare. To prove that an enophthalmos actually exists, it would be necessary to measure the position of the eyes with an instrument such as the exophthalmometer. The majority of cases of so-called enophthalmos are due to a narrowing of the palpebral fissure due to a change in the position of the eyelids in relation to the surface of the eye. This more common "apparent" type of enophthalmos may be associated with Horner's syndrome and, in an older age group of people, with myasthenia gravis. Certain disturbances in the brain stem also may produce ptosis of the eyelids and relative enophthalmos, although in most cases the narrowing of the palpebral fissure is accompanied by some degree of ophthalmoplegia. In some people there is a narrowing of the palpebral fissure and apparent enophthalmos associated with severe orbi-

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

tal pain or with headaches such as migraine. In true enophthalmos, there may be an actual decrease in orbital fat; but all such persons usually have a history of orbital fracture or face injury. Another disorder that is said to be associated with true enophthalmos is so-called intermittent exophthalmos. This is a rare disorder characterized by intermittent, rather pronounced protrusion of one eye caused by a venous stasis in the affected orbit, which in turn is brought on by sudden changes in the position of the head. When this venous pressure is suddenly released, the exophthalmos subsides and a true enophthalmos may then be present for some minutes.

TREATMENT OF NARCOLEPSY

To the Editor:—*Is there any new treatment for narcolepsy? Therapy with the usually given drugs has been unsuccessful. A 43-year-old patient has had this trouble for more than 10 years. The thyroid is normal, as is blood sugar level, encephalogram, and blood cell counts.*

Arthur Bamberger, M.D., New York.

Answer.—Finley (in Forster, Modern Therapy in Neurology, C. V. Mosby Company, 1957, p. 39), says, "The treatment of narcolepsy consists of the use of amphetamines. It is often necessary to use large doses, and amphetamine sulfate or dextro amphetamine sulfate may be employed. It is usually wise to begin with 10 mg. in the morning and 5 mg. at noon and increase or decrease the dose as indicated. It is best not to give medication later than 3 or 4 p. m., so as not to interfere with night sleep. Patients have received as much as 140-180 mg. per day of amphetamine before relieving the pathological sleep. Usually, however, 20, 30, or up to 50 mg. per day will suffice. The use of amphetamines in the 15-mg. long-acting form tends to spread the effective medication throughout the day so the drug taken in the morning gives a more even distribution of drug response through the day."

Haymaker and Anderson (in Baker, Clinical Neurology, vol. 2, Paul B. Hoeber, Inc., 1955, p. 1207) state, "Amphetamine sulfate has proved highly beneficial in the treatment of narcolepsy and cataplexy. The same is true of dextro amphetamine sulfate (a dextrorotatory amphetamine), which, because of its somewhat higher potency, can be administered in smaller doses. The dosage varies with each patient; 10 mg. two or three times daily usually suffices. Administration should be started in the morning. Medication should be stopped in the late afternoon so as not to interfere with sleep. When amphetamine causes gastrointestinal disturbances, feelings of tension or anxiety, or palpitation with cardiac extrasystoles, dextro amphetamine should be substituted, the maximal daily dose being 50 mg. If this drug, too, cannot be tolerated, ephedrine sulfate should be tried. Commonly, narcolepsy can be controlled by desiccated thyroid administration, the initial dose of about 8 mg. being gradually increased to tolerance, as determined by the subjective response and the pulse rate. There are reports that symptomatic cure has been achieved by repeated injections of air into the subarachnoid space or by performing encephalography or lumbar puncture. In those instances in which the cataplexy remains unresponsive to the measures described, some help may be obtained by giving the patient 0.6-1.5 Gm. of potassium chloride three times a day." They add, "The patient should not engage in an occupation in which he may endanger his own life or the lives of others and should not drive an automobile or other vehicle."

NICOTINIC ACID

To the Editor:—*Please give information on certain pharmacological actions of nicotinic acid and its derivatives. Otologists use nicotinic acid almost routinely to treat Ménière's syndrome, yet internists are skeptical about its ability to cause any vasodilatation of the intracranial arteries, of which the arteries to the inner ear are branches. Does nicotinic acid cause a dilatation of the intracranial vessels, including the cochlear and vestibular arteries? What effect has nicotinic acid on the caliber of the pulmonary vessels? If it causes vasodilation, could this effect be of any use in combating the endarteritic process which leads to progressive idiopathic emphysema? Ophthalmologists in the Middle West have been using nicotinamide in cases of senile macular degeneration, feeling that this compound has enough vasodilating effect to combat the retinal ischemia leading to this condition. How much vasodilating effect does it have?*

Paul Guggenheim, M.D., Council Bluffs, Iowa.

Answer.—The question as to whether or not nicotinic acid causes vasodilatation of intracranial arteries is just as debatable as is that of the action of any other drug in this area. The most recent evidence is that vasodilatation may occur by the action of certain chemicals and that presumably the cochlear and vestibular arteries would be affected. A feeling of increased fulness of the head and awareness of the pulse are symptoms indicating vasodilatation after nicotinic acid administration. There is no evidence of the effect of nicotinic acid on the pulmonary bed. Even if vasodilatation was produced by nicotinic acid, the effect would be so transient that it is doubtful that there would be any value in combating progressive idiopathic emphysema. Nicotinamide has, essentially, no vasodilating action. Such action is definite and noted with nicotinic acid but not with the amide. Ophthalmologists should be able, however, to observe the retina and determine whether there is any improvement in retinal ischemia in senile macular degeneration when these drugs are given.

OVULATION IN LACTATING WOMEN

To the Editor:—*What authority exists for the commonly held notion that a woman does not become pregnant or that ovulation does not occur while she is breast feeding a baby?*

Frank Howard Richardson, M.D.
Black Mountain, N. C.

Answer.—Ovarian function is suppressed but not completely inhibited during lactation. Recent evidence indicates that it is the stimulus of suckling of the infant rather than lactation which acts on the pituitary gland, probably by way of the midbrain. The decrease in the frequency of feedings and the cessation of nursing result in the reestablishment of ovarian function, the reappearance of menstruation, and, ultimately, ovulation. Complete breast feeding in the early months of life is a fairly effective method of suppressing ovarian function and conception. In a study of women post partum, McKeown found that menstrual bleeding reappeared in an increasing number of women as lactation proceeded and returned more rapidly, even in the early months, if the child was weaned. Of 1,227 women, 87 became pregnant within a year after delivery. Only 10 of these 87 women conceived while their children were being wholly or partially breast fed. Of these 10 women, 4 conceived before the onset of menstruation, 2 after an initial bleeding period, and 4 after 2 or more menstruation periods.

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INFECTION WITH ESCHERICHIA COLI

To the Editor:—*Postmortem findings in a 70-year-old woman, who clinically had an acute peritonitis of unknown cause, were cirrhosis of the liver and peritonitis, pericarditis, and pleuritis, all due to Escherichia coli. How does such an infection occur?*

Robert Q. Shupe, M.D.
Huntington Beach, Calif.

Answer.—The relative frequency of bacteremia caused by gram-negative bacilli in the presence of liver cirrhosis has often been reported (Martin and others, *A.M.A. Arch. Int. Med.* 98:8, 1956; Whipple and Harris, *Ann. Int. Med.* 33:462, 1950). It is probable that the peritonitis, pericarditis, and pleuritis in the case in question are the result of such a bacteremia. Portal vein blood has been found repeatedly to contain Esch. coli, probably coming from the intestine, although some investigators fail to confirm this observation. It is assumed that, normally, Kupffer's cells of the liver remove these bacteria, and it has been postulated that in severe hepatic diseases this filtering action of the hepatic reticuloendothelial system is impaired. In addition, in hepatic cirrhosis, portal vein blood bypasses the hepatic parenchyma either through extrahepatic portosystemic collateral vessels as found in the abdominal wall or in esophageal varices or through intrahepatic anastomoses between branches of the portal vein and tributaries of the hepatic vein. These vascular anastomoses (McIndoe, *Arch. Path. & Lab. Med.* 5:23, 1928; Popper and others, *Am. J. Clin. Path.* 22:717, 1952), characteristic of cirrhosis, are probably more important in predisposing to Esch. coli septicemia in this disease.

PSORIASIS

To the Editor:—*Please give information on the use of triamcinolone in treatment of psoriasis.*

J. G. Martin, M.D., Wadsworth, Ohio.

Answer.—Triamcinolone diacetate (9 α-fluoro-16 α-hydroxy-hydrocortisone-diacetate) is a derivative of prednisolone. The corticosteroids are not generally recommended for the routine treatment of psoriasis. They are sometimes used for a short period when the disease is so widespread that the patient is a virtual psoriatic cripple.

HIATUS HERNIA

To the Editor:—*1. Can a congenital predisposition or weakness of the esophageal hiatus exist in a middle-aged person without actual hernia, similar to a predisposition to inguinal hernia? 2. Under such circumstances, can the strain of heavy lifting produce an acquired, apparently irreducible, esophageal hiatus hernia, involving about one half of the stomach? 3. Can a preexisting sliding esophageal hiatus hernia, involving one half of the stomach in a middle-aged person, become apparently irreducible after the same type of strain? 4. Is shock a necessary concomitant in either of the above cases? 5. Is esophageal hitatus hernia of the diaphragm, as found in adults, usually acquired, in contrast to the congenital variety of diaphragmatic hernia which commonly occurs in entirely different areas of the diaphragm?*

M.D., New York.

Answer.—1. This is a commonly accepted point of view, since it explains the development of esophageal hernia in middle-aged patients. 2. Theoretically, this could occur, but in actual practice, when rupture of the diaphragm is produced by trauma, the area involved is other than the esophageal region. 3. It is unlikely that a preexisting hernia would become irreducible after heavy lifting. 4.

Trauma of sufficient severity to produce diaphragmatic rupture usually is accompanied by other shock-producing internal injuries. Cases of traumatic rupture of the diaphragm not recognized until years after the injury because of the paucity of findings at the time of the accident have been reported. 5. Esophageal hernia is acquired in the sense that it usually develops during middle age, but it develops only in those patients in whom there is a muscular and fascial deficiency.

To the Editor:—*By what mechanism does a hiatus hernia produce symptoms similar to those of angina pectoris and coronary occlusion?*

H. O. Skinner, M.D., St. Paul, Minn.

Answer.—The substernal distress of hiatus hernia may be confused with the precordial pain of angina pectoris. The pain is probably caused by peptic esophagitis or distension of the intrathoracic portion of the stomach rather than by direct pressure on the heart.

LOSS OF TOENAILS

To the Editor:—*Is there any clinical significance in the spontaneous loss of the second toenail from each foot within a period of one month? The patient is a 30-year-old man in good health. The toenails are growing back normally.*

M.D., Virginia.

Answer.—Spontaneous separation of the nail from its bed, or onychomadesis, is often without any clinical significance, and the cause is hard to determine. A number of similar cases have been reported and also others in which several nails have been involved. This phenomenon has also been observed during the terminal phase of scarlet fever and other eruptive diseases. Occasionally, it is seen in conjunction with an extensive alopecia areata, dermatitis exfoliativa, and tabes, but in most cases the cause remains obscure.

TYING THE UMBILICAL CORD

To the Editor:—*What is the most effective way to tie the umbilical cord in the newborn infant? A former practice at this hospital was doubly ligating all cords with a linen cord; this has been abandoned because of rare umbilical bleeding. Some physicians are using Ziegler umbilical clamps, and others are using a spring wire device. The hospitals concerned are small, and convenience in removing the device is important.*

J. E. Rockwell Jr., M.D., Grangeville, Idaho.

Answer.—There is no "most effective way" to tie or occlude the umbilical cord in the newborn infant. Complete occlusion of the umbilical vessels can easily be accomplished by simple means that do not require such special attention or removal as special umbilical clamps demand. Completely satisfactory ligation can be secured with a piece of linen bobbin, coarse silk, a rubber band, or strong string. Except in cases of possible erythroblastosis where the portion of cord attached to the baby should be left long, only a small piece of cord should be left on the baby. This will fall off with whatever disposable material was used to ligate the cord. Regardless of which of these ties is used, the knot must be secure; this is obtained by tightening the knot slowly and uninterruptedly, thus permitting the jelly of Wharton to escape from under the material used for tying.

MAGNESIUM SULFATE DRESSINGS

To the Editor:—*Is there any rational purpose in the use of magnesium sulfate in water for compresses and soaks to injured parts? If not, how did this absurd practice arise?*

M.D., Pennsylvania.

Answer.—Three of the cardinal signs of inflammation, rubor, tumor, and dolor, result from the edema, hyperemia, and stasis in acutely injured tissues. The deposition of fibrin and continuously decreasing tissue permeability further barricades the inflamed zone, thereby precluding drainage of entrapped lymph and edema fluid. The application of wet soaks or dressings containing hypertonic salt solutions aims at augmenting the osmotic pressure beyond the increasingly impermeable peri-inflammatory membrane. Since fluid flows from areas of lesser to greater osmotic tension, reduction of inflammatory edema is facilitated by any agent capable of heightening the osmotic pressure of adjacent or surrounding tissues. Thus, the use of magnesium sulfate in wet dressings for acutely injured tissue is by no means an absurd practice.

SEROLOGIC TESTS FOR SYPHILIS

To the Editor:—*What is the significance of negative findings in a Kolmer's test and faintly positive findings in a Venereal Disease Research Laboratory (VDRL) test in the same patient? This has been reported in patients with no syphilitic history and even in some with negative spinal fluid findings.*

M.D., California.

Answer.—These results may be obtained in the presence of the following conditions: (1) old, treated syphilis, (2) very early, untreated syphilis, (3) a collagen disease, and (4) certain acute infectious diseases. Such results also may follow recent vaccination against smallpox, or they may represent a zonal reaction. The aberrations reported are more likely to be the results of a VDRL testing system which is too sensitive, or they may be caused by the technicians' overreading the test. VDRL tests should be read as follows: no clumping or very slight roughness, nonreactive; small clumps, weakly reactive; and medium or large clumps, reactive. It is difficult to interpret the expression "faintly positive." The phrase suggests that the laboratory is not following standard procedure. When weakly reactive results are obtained, the serum should be retested by means of the quantitative procedure before a report is submitted.

CYSTIC MASTITIS

To the Editor:—*A woman in her late forties, still regularly menstruating, breast fed her two children (now grown up and healthy). There is no family history of tumors, but she now has several masses in both breasts, of "many years'" duration. Five years ago one of them was aspirated and yielded 10 cc. of dark fluid. One year later, a lump was excised from the other breast and the clinical diagnosis of cystic mastitis was confirmed. Recently, another lump was excised and reported to be fibrocystic with one small fibradenoma. What future course should be pursued with regard to these tumors?*

M.D., New York.

Answer.—Watchful waiting is important in this problem. Involution of cystic mastitis usually sets in after the menopause, but chronic fibrotic-walled cysts cannot be expected to regress. Whether cystic disease of the breast is always a precancerous lesion has been a most controversial subject, but here is no real foundation for such a concept. The ate Dr. J. C. Bloodgood, in his later years, concluded that chronic cystic mastitis was not precancerous.

ULTRASONIC THERAPY

To the Editor:—*Other than the usual contraindications in using ultrasonic therapy on adults, are any special precautions indicated in its use on infants and children? When using such therapy on infants and children, should the watts per square centimeter and duration of application be reduced? Of particular interest is its use in patients with chronic, nonproductive, afebrile bronchitis, subsequent to an upper respiratory infection, that does not respond to any cough medication or various antibiotics.*

Jack L. Boyd, M.D., Homestead, Fla.

Answer.—Ultrasonic therapy should be used with extreme caution when treating infants and children. As a rule, the watts per square centimeter should be reduced to levels that are known to be safe. There is no conclusive evidence in the literature, however, that ultrasonic therapy is of any value in the treatment of chronic bronchitis, and its use for this purpose cannot be recommended.

TREATMENT OF ABRASIONS AND LACERATIONS

To the Editor:—*In* The Journal *for Feb. 8, 1958, page 710, a question concerns an antiseptic agent which could conveniently and painlessly be used for children injured at school. Hexachlorophene was briefly mentioned. I would like to expand on the versatility of this antiseptic. The standard 3% solution used in many operating rooms and also as an agent to prepare operative wound sites is well known. It is surprising that hexachlorophene soap, which is equally as satisfactory, has not been more widely used. In the past two years I have replaced all antiseptic ointments with undiluted hexachlorophene applied directly on the most severely abraded, lacerated wounds and burns of the skin without evidence of dermatitis or other manifestations of sensitivity. It is a most efficient antiseptic and causes little or no discomfort to the most sensitive wound areas. If the dressings are changed every other day, they will neither dry out nor become painfully adherent. I have advised many patients to replace the standard tincture antiseptics for home use with hexachlorophene. In the emergency room the severely contaminated injuries of the skin and underlying structures, including compound fractures, are treated by a compress with an antiseptic detergent containing hexachlorophene diluted half and half with water. This placed on a severely contused wound and followed by a compression dressing and splint will most satisfactorily take care of the compound fracture which cannot be treated in the emergency room and must await more definitive care in the operating room.*

A. F. Serbin, M.D.
99 Pratt St.
Hartford 3, Conn.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*The procedure described is probably sound, although this consultant has had no experience in its use. Presumably Dr. Serbin uses hexachlorophene soap, rather than pure hexachlorophene as indicated above. The compress procedure with the antiseptic detergent seems especially logical. Since hexachlorophene is more bacteriostatic than bacteriocidal, it can hardly be classed with the usual rapidly killing germicides.*

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Proposed White House Conference on Aging Indorsed by A.M.A. . .

VA Altering Arrangements for Home-Town Care Program . .

Workmen's Compensation in Radiation Hazards . .

Compromise Bill on Aid to Medical Schools Being Drawn Up . .

A. M. A. SUPPORTS LEGISLATION FOR WHITE HOUSE CONFERENCE ON AGING

The American Medical Association is supporting legislation that would request President Eisenhower to call a White House Conference on aging and make grants to the states to help them conduct state conferences prior to the meeting in Washington.

The A. M. A.'s views were presented to Chairman Roy W. Wier (D., Minn.) of a subcommittee of the House Committee on Education in a letter from the Association's general manager, Dr. F. J. L. Blasingame. While backing the White House conference, the letter said that the A. M. A. would prefer that action be deferred on proposals to set up a separate bureau on aging in the Department of Health, Education, and Welfare and to establish a commission on aging. It was pointed out that the White House conference probably would consider these ideas among others.

The Blasingame letter mentioned that the A. M. A. has had a "deep and longstanding" interest in the problems of the aged, particularly their health needs. It described the work of the Association's committee on the aging, the recent conferences conducted by the committee, and the activity of state medical societies in this field.

Dr. Blasingame also pointed out that the A. M. A. is a member of the recently formed Joint Council to Improve the Health Care of the Aged, which will intensify research in this field through joint efforts and will initiate projects as rapidly as possible.

The letter adds:

"The American Medical Association believes very strongly that there is a need for systematic interchange of ideas in this field. Through our experience with our regional conferences on aging and through our activities as a member of the Joint Council, we have learned that much is to be gained from state and national conferences on this subject, such as proposed in H. R. 9822 and H. R. 11835. The members of the medical profession will take part in these conferences, both on the state and national levels, to the fullest extent possible."

NEW FEE SYSTEM FOR VA HOME-TOWN CARE

The Veterans Administration is about to set up a new system of fee schedules for state medical societies under the VA home-town medical care program. The emphasis, according to Dr. A. J. Klippen, VA director of clinics, will be on informal agreements with more flexibility than in the past.

In 25 states in which contracts expire this June 30, the new policy will become operative first. These states are Arkansas, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kentucky, Maine, Massachusetts, Missouri, Nevada, New Hampshire, New Jersey, North Dakota, Ohio, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, West Virginia, Wyoming, and New York. New York operates under a special type of agreement.

Medical societies in 15 other states, the District of Columbia, and Puerto, where VA has no home-town contracts with medical societies or intermediaries, will be given an opportunity to negotiate new schedules with VA, Dr. Klippen said. The states are Alabama, Arizona, Iowa, Kansas, Louisiana, Maryland, Minnesota, Mississippi, Montana, Nebraska, New Mexico, Oklahoma, Rhode Island, Texas, and Utah.

Eight states and Hawaii, where VA had contracts with intermediaries rather than medical societies, will not be affected by the change. The states are California, Colorado, Michigan, North Carolina, Oregon, South Dakota, Washington, and Wisconsin.

Simplification of administrative work under the new agreements is expected to result in better service to veterans as well as benefitting physicians, Dr. Klippen said. Chief medical officers in the various VA regions plan to meet with officers of state and territorial medical associations to establish mutually acceptable fee schedules.

Under the home-town care program, veterans with service-connected disabilities are offered free choice of physicians in areas where VA medical facilities are not available.

The original directive, signed by Chief Medical Director William Middleton, states that, in the future, adjustments of fees listed in the schedule worked out through the medical society may be proposed. New proposals with supporting justification must be submitted to the VA field office, prior to Jan. 1 of each year, for review by the chief medical officer. Those approved become effective at the start of the next fiscal year.

AFL-CIO HOLDS CONFERENCE ON WORKMEN'S COMPENSATION

An AFL-CIO national conference on workmen's compensation, held in Washington to mark the 50th anniversary of the first compensation law, seeks to lay the groundwork in another area—protection against radiation hazards.

A subcommittee of the Joint Atomic Energy Committee plans hearings in June on the subject of workmen's compensation involving radiation injuries in industry and research. This would include hospitals, clinics, and other places where radioactive material is being used.

Andrew Biemiller, director of the AFL-CIO legislative department, pointed out at the conference that federal safety standards and licenses are required of all who wish to use certain radioactive materials or operate a nuclear reactor. Congress has also authorized public liability insurance for the nuclear reactor industry.

"But there has been no corresponding federal action to provide for the needs of injured workmen," Biemiller declared. "In light of the continued reluctance and refusal of the states to furnish the needed protection, Congress should not hold off any longer."

James J. Reid, commissioner of the South Carolina Industrial Commission, raised questions on the adequacy of state workmen's compensation laws. "Why should it not be the burden of employment to furnish medical care as long as is necessary to restore the employee who suffers occupational harm as nearly as possible to normal? By what strange reasoning is it that a law charges the employer with the burden of occupational harm to human beings and then permits that burden to be discharged when medical charges reach $450 and when disability or death payments reach a few thousand dollars?" he asked.

Secretary of Labor Mitchell had some advice for the leaders in workmen's compensation programs attending the conference: Don't count on the U. S. Congress for any changes in such programs; seek improvements in state laws. He said the states should strive for the following as an ideal law: all workers covered, full medical benefits, advisory medical panels to supervise medical benefits, waiting period for benefits of not more than three days, and total disability benefits for life.

SUBCOMMITTEE WRITING COMPROMISE SCHOOL AID BILL

An 11-man health subcommittee of the House Interstate Committee has taken on the difficult assignment of perfecting a federal-aid-to-medical-schools bill that will reconcile conflicting views in Congress. Hearings on a variety of construction grant bills ended late in April before the group headed by Rep. John Bell Williams (D., Miss.).

The subcommittee first took up legislation on chemical additives in foods, milk standards, and a redefinition of chemical preservatives, and then it scheduled executive sessions on medical school grants. Because of the complexity of the subject, there was no estimate of when the subcommittee would have a bill ready for the full committee.

There are some in Congress who flatly oppose federal aid to any schools, although their reasons differ. Some opposition involves the issue of segregation. Another group feels that emphasis should continue to be placed on nonfederal funds, either from private sources or from the states.

The subcommittee may also have to take up the question of a formula for distributing federal funds to medical schools. Some may favor matching grants directly to schools, or others may favor a state agency like the Hill-Burton hospital agencies.

Concluding witnesses in the public hearing were Drs. Leroy Burney, surgeon general of the Public Health Service, and Aims C. McGuinness, special health assistant to Secretary Folsom.

Dr. Burney opposed the inclusion in the bills of schools of podiatry or veterinary medicine on the grounds that the higher priority needs were for schools of medicine. Chairman Williams then raised the question as to why schools of osteopathy were included in the administration's bill.

The surgeon general also opposed the proposal in several bills before the committee for increasing federal grants from 50 to 66⅔% if a school can step up its freshmen enrollment 5%. "Medical schools will do that without such incentive when they have increased their faculty and facilities," he said.

This is the same view taken by the American Medical Association in supporting one-time construction grants for medical schools.

Other points in the Burney testimony are the following: 1. The administration has no plans for asking, at any time, for school operating funds. 2. During the next 10 years the present ratio of physicians to population (one for every 750 persons) will have to be maintained.

Dr. McGuinness stressed that many existing medical schools are outmoded functionally and their physical plants are badly in need of replacement.

MISCELLANY

The staff of the House Appropriations Committee has started an investigation of the Dependents' Medical Care Program (Medicare), which has been in operation since December, 1956. It is not known how extensive the survey will be.

Dr. Hugh H. Hussey, a member of the Board of Trustees of the American Medical Association and professor and director of the Department of Medicine at Georgetown University Medical School, has been appointed dean of the school, effective July 1. He succeeds Dr. Francis M. Forster, who will continue as professor and director of the department of neurology, but will devote more time to research, especially in epilepsy and multiple sclerosis.

Scientists from 14 nations have been invited to witness a large nuclear weapons explosion in July or early August to learn of progress by United States scientists in reducing radioactive fallout. Invitations were extended through the United Nations.

THE JOURNAL
OF THE
American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 167, NO. 2
CHICAGO, ILLINOIS
MAY 10, 1958

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ENTEROPATHOGENIC VIRUSES AND BACTERIA

ROLE IN SUMMER DIARRHEAL DISEASES OF INFANCY AND EARLY CHILDHOOD

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ALTHOUGH bacteria belonging to the Shigella, Salmonella, and pathogenic Escherichia coli groups are known to be etiologically associated with diarrheal diseases that become especially prevalent among infants and young children during the summer season in temperate zones, it is also known that these enteropathogenic bacteria are frequently absent in the vast majority of such patients. The available data on the etiology of infectious diarrheal diseases were summarized recently by Hodes[1] and Higgins.[2] Although evidence for the etiological role of certain filtrable agents has been adduced by studies on human volunteers (summarized by Gordon[3]), the role of the large number of viruses recovered in recent years from the human intestinal tract either by inoculation of newborn mice (the Coxsackie group predominantly) or by tissue cultures has as yet received little attention.

A test group of 153 children with summer diarrhea were compared with a matched contratest group of 100 children without diarrhea as to the results of bacteriological and virological examination of rectal swabs. In addition, acute and convalescent phase serums were obtained from many of the patients. The number of enteroviruses recovered from the rectal swabs of the test group was 2.5 times the number recovered from the contratest group. Viruses of the ECHO group were recovered six times more often from the children with diarrhea, and it is only to these viruses that a statistically significant etiological role could be assigned. Other important data as to the etiological significance and interrelations of enteropathogenic viruses and bacteria were obtained. It appeared that summer diarrhea of very young children is not an entity but rather a consequence of transitory infections with a large variety of bacterial and viral pathogens.

At least 46 distinct viruses, including 3 types of poliovirus, 19 types of Coxsackie A, 5 types of Coxsackie B, and 19 types of ECHO (enteric cytopathogenic human orphan viruses) recently grouped together as enteroviruses,[4] are already known to be multiplying at various times in the human intestinal tract, and a considerable number

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of new candidates are awaiting their turn for admission into this rapidly expanding group of human viruses. Although Travassos and associates[5] recovered Coxsackie A viruses from 9 of 20 infants with gastroenteritis in Brazil, Pohjanpelto[6] found Coxsackie viruses, mainly A 4, in only 4.4% of a group of 187 patients with diarrhea in Finland, and Parrott[7] recovered only four Coxsackie strains (all group A) from 165 children with undiagnosed miscellaneous diarrheal diseases in the United States.

After a study of the incidence and characteristics of the ECHO viruses among healthy children in Cincinnati[8] and Mexico,[9] we undertook an investigation of the role of the ECHO and other enteroviruses in the summer diarrheas of infants and children in Cincinnati. The orienting studies on the material collected from 56 children with diarrhea during the summer of 1955 indicated that enteroviruses of many different types could be recovered in monkey kidney tissue cultures from 50% of the patients.[10] The fact that such viruses were recovered from only 6% of 154 children, aged one to four years, without diarrhea in Cincinnati in 1953, and that serologic tests on many of the children with diarrhea indicated that the viral infections and the clinical manifestations had their onset at about the same time, strongly suggested an etiological association between the two events.

It was realized, however, that the results obtained on healthy children in one year did not provide a suitable control for the results obtained on children with diarrhea in another year. Accordingly we repeated this study in 1956 and extended our observations to include simultaneous tests on a control group without diarrhea matched for age, socioeconomic status, and time of sampling. We also tested both groups for enteropathogenic bacteria and for Coxsackie A viruses by inoculation of newborn mice. The final results obtained on 153 children under four years of age with diarrhea in 1955 and 1956 and on 100 children of similar age without diarrhea form the basis of the present communication.

Procedure and Methods of Study

The children selected for this study were all seen in the clinics or wards of the General and Children's hospitals of Cincinnati during the summers of 1955 and 1956. Approximataly 75% were under one year of age, and the remainder were under four years of age. They generally belonged to the lower-income group and were residents of Cincinnati. The "diarrhea" group was made up of children who were brought to the hospitals because of sudden onset of diarrhea, frequently but not always associated with fever, vomiting, and dehydration. The 1956 control group "without diarrhea" was made up of children who were brought to the same clinics for routine examinations or reasons other than acute illness, and were selected, matched for age and numbers, as far as possible on the same days that children with diarrhea were admitted to the study.

Although the children in the control group had no history of diarrhea during the preceding month, there were unfortunately no provisions for follow-up regarding the development of diarrhea or other acute illness during the week or two after rectal swabs were obtained from them. Accordingly "without diarrhea" has reference only to the condition at the time of sampling and does not exclude the possibility that at least some of the children in this group may have developed this syndrome subsequently.

Although stool specimens would naturally be expected to yield a higher incidence of virus isolations, it was more expedient to limit the study to rectal swabs. The specimens were obtained as soon as possible after onset, on the first visit to the clinic or shortly after admission to the hospital, not only to increase the chances of virus recovery but also to eliminate the possibility of picking up viruses or bacteria transmitted in the hospital subsequent to admission. A sterile cotton swab was moistened in Hanks' balanced salt solution, passed through the anal orifice, turned around and removed. In the 1955 tests, the Hanks' solution contained 100 units of penicillin and 0.1 mg. of streptomycin, and only a single swab was obtained from each patient and put into 2 ml. of the solution.

In an attempt to increase the chances of virus recovery, two swabs were obtained from each child in 1956 and both were put into a single tube containing 4 ml. of Hanks' solution without antibiotics because an aliquot of the same solution was to be used for isolation of enteropathogenic bacteria. The tubes containing the contaminated swabs and solution were stored in a deep freeze at about —20 C. On the day of test the specimens were thawed, the swabs were drained against the sides of the tube and discarded, and to the portions used for virus isolation enough penicillin and streptomycin were added to yield concentrations of 2,000 units and 2 mg. per milliliter respectively. In 1956 we also added enough mystatin (Mycostatin) to yield 150 units per milliliter. When the extracts of the swabs were acid, two or three drops of a 4.4% solution of sodium bicarbonate were added to bring the pH to about 8. After storage for 30 minutes in the refrigerator, the extracts were used without centrifugation.

Isolation and Identification of Cytopathogenic Viruses

Trypsinized cynomolgus monkey kidney cells grown in stationary roller tubes were the only tissue cultures used. The outgrowth medium consisted of 0.5% lactalbumin hydrolysate in Hanks' solution and 2% heated calf serum, and 0.5 ml. of a 1:200 suspension of trypsinized cells was distributed in each tube. In 1955, the medium was neither removed nor changed, and after the cells had formed a confluent sheet in six to seven days, 1.5 ml. of maintenance medium (0.5% lactalbumin hydrolysate in Earle's solution) was added and the tubes were ready for use. In 1956, the outgrowth of cells was enriched by adding more growth medium after four days, and before use the serum-containing medium was removed and replaced by the maintenance medium without serum. Each specimen was inoculated into three or four tubes (0.2 ml. per tube).

In order to increase the comparability of the tests on the diarrhea and control groups, a similar number of specimens from the control group were inoculated into tissue culture tubes of the same lot of monkey kidney cells as were used for the specimens from the diarrhea group. The inoculated culture tubes were kept in roller drums in an incubator at 36 to 37 C. The tubes were observed microscopically daily or every other day for two weeks for evidence of cytopathogenic change. No blind passages were carried out, and only the tubes that exhibited definite or suspected specific cytopathogenic changes were harvested for passage into a new series of tubes to establish the transmissibility of the cytopathogenic agent and to provide culture fluid for serologic identification.

Each cytopathogenic agent was first titrated in tissue culture in order to avoid the misleading results that may be obtained when amounts of virus significantly greater or smaller than 100 TCD_{50} (tissue culture infective doses) are used for serologic identification. The antiserums used to identify these agents were either prepared and standardized by ourselves or supplied by others. The poliovirus and some of the ECHO antiserums were those prepared by Wenner and co-workers [11] and checked by the committee on enteroviruses of The National Foundation for Infantile Paralysis,[4] and some of the Coxsackie antiserums were supplied by Drs. J. L. Melnick and J. T. Syverton. The preliminary identification was carried out with pools of poliovirus, ECHO, and Coxsackie antiserums [4] except for the ECHO 4 and 14, and the Coxsackie B 5 antiserums which were used individually because of their low potency. When an agent was neutralized by a given pool, it was finally typed by neutralization tests with the individual antiserums. Antiserums for Coxsackie types A 7, A 9, and A 14 were also used but the only Coxsackie A viruses recovered in the monkey kidney tissue cultures were type A 9.

All cytopathogenic agents which failed to be neutralized by the available serums were tested in newborn mice. The unclassified strains, which failed to produce apparent disease in newborn mice, were used for the preparation of antiserums. With the exception of three unclassified cytopathogenic and newborn mouse pathogenic strains, all but five of the viruses recovered in 1955 could be classified. The antiserums prepared against these five strains indicated that two were antigenically broader relatives of ECHO 6, one an antigenically broader relative of ECHO 10, and the remaining two became the prototypes of the ECHO 18 and ECHO 19 viruses.[12] These antiserums, as well as the antiserums for the new ECHO types 15, 16, and 17, were also used for the identification of the strains recovered in 1956. Although monkey kidney tissue cultures are not the medium of choice for the recovery of adenoviruses, four strains belonging to this group were isolated from the rectal swabs obtained from children with diarrhea; the distinctive cytopathogenic changes first suggested the presence of adenoviruses. Drs. Wallace Rowe and Isaac Ruchman did the serologic identifications and typing. It is noteworthy that 45 of the 54 cytopathogenic agents isolated in 1956 could be classified with the available serums.

Table 1.—*Isolation of Viruses and Pathogenic Bacteria from Rectal Swabs of Children With or Without Diarrhea During Summer of 1955 and 1956 in Cincinnati*

		Virus Isolations					Bacteria Isolations			
		Monkey Kidney Cultures		Newborn Mice						
Group	Yr.	No. Tested	No. Positive	No. Tested	No. Positive	Virus Positive Total	No. Tested	Shigella or Salmonella	Pathogenic Esch. Coli	No. Patients with Pathogenic Esch. Coli Yielding Virus
Diarrhea	1955	56	24 (43%)	32*	4 (12.5%)	28 (50%)	41	5 (12%)		
							15		3 (20%)	2/3 (67%)
	1956	97	41 (42%)	56*	6 (10%)	47 (48%)	86	6 (7%)	26 (30%)	13/26 (50%)
No diarrhea	1956	100	13 (13%)	87*	7† (8%)	20 (20%)	64	0	13 (20%)	2/13 (23%)

* These specimens failed to yield a virus in monkey kidney tissue culture.

† One of these strains, after passage in mice, proved to be cytopathogenic in monkey kidney tissue culture and was identified as Coxsackie B 4

Tests for Noncytopathogenic Coxsackie A Viruses

All rectal swab extracts that failed to yield a cytopathogenic agent were inoculated in Swiss albino newborn mice less than 24 hours old—0.02 ml. intracerebrally and 0.1 ml. subcutaneously for each mouse. The animals were observed for 21 days, and those found dead or with suggestive signs of infection two or more days after inoculation were used for the preparation of a suspension for further tests. A 20% suspension of the carcass and viscera was passed to another litter of newborn mice and also inoculated in four tubes of monkey kidney tissue culture. Only one of the 17 strains of virus recovered in newborn mice from the tissue culture negative specimens proved to be cytopathogenic for monkey kidney tissue culture after passage in mice, and by histological and serologic examinations it proved to be a Coxsackie B 4; the other 16 strains produced only the muscle lesions that are associated with infections by Coxsackie A viruses. Herpes viruses would have been cytopathogenic after passage in mice and would also have produced different lesions in the animals. Accordingly these noncytopathogenic, newborn mouse pathogenic strains were classified as Coxsackie A viruses.

Table 2.—*Influence of Age of Children in Diarrhea and Control Groups on Recovery of Viruses from Rectal Swabs (Cincinnati, 1956)*

	Diarrhea			No Diarrhea		
	No.	Positive*		No.	Positive*	
Age Group, Yr	Tested	No.	%	Tested	No.	%
<1	71	34	48	75	12	16
1 to 3	26	13	50	25	8	32
Total	97	47	48	100	20	20

* Positive by test in monkey kidney tissue culture and in mice.

Serologic and Bacteriological Studies on Patients

Acute and convalescent phase serums obtained from many but not all of the patients were used for two purposes: (1) to establish a rising antibody titer against the virus recovered from the patient which would indicate that the disease and the infection with the virus had their onset at about the same time, and (2) to determine the occurrence of infection among patients from whom no virus was recovered in the small amount of material obtained on the rectal swabs. Neutralization tests using tenfold dilutions of serums and 100 TCD_{50} of virus were carried out in tissue culture tubes, the endpoint being determined by the presence or absence of a cytopathogenic effect. The recorded titers represent the 50% serum dilution endpoints based on the readings six to eight days after inoculation; in some instances these titers were higher in the earlier readings because the effect of antibody manifests itself by a retardation as well as by complete inhibition of the cytopathogenic effect. The methods used for the isolation and identification of bacteria from the rectal swab extracts were those described by Edwards and Ewing.[13]

Results

The data shown in table 1 indicate that the number of enteroviruses recovered from the rectal swabs of the children with diarrhea was remarkably similar in 1955 and 1956, i.e., 50% and 48%, respectively, while in the control group of 1956 it was only 20%—a 2.5-fold difference. When one separates the enteroviruses into the noncytopathogenic, newborn-mouse-pathogenic group (Coxsackie A), and the cytopathogenic group, one finds a threefold higher incidence of the latter among the children with diarrhea and no difference in the incidence of the former. The incidence of Shigella and Salmonella organisms combined was only 7% in the 1956 diarrhea group while none were recovered from the control group. On the other hand, the incidence of pathogenic Esch. coli was approximately the same in both groups, although it will be shown later that at least one of the serotypes occurred much more frequently in the diarrhea group.

The data shown in table 2 indicate that in the diarrhea group the incidence of all enteroviruses was about the same in the infants under one year of age as in the one to three-year-old children, while in the control group the incidence of these viruses was twice as high in the older children than in the infants under one year of age. It should also be noted that the numbers of children in each age group are approximately the same in both groups, and that among the 97 randomly selected children with diarrhea 73% of the cases occurred in *infants under one year of age.*

The data shown in table 3 indicate not only that the diarrheal diseases became more prevalent as summer progressed but also that the incidence of virus recovery also progressively increased from 20% in June, to 35% in July, and 59% in August.

The data shown in table 4 indicate that the 65 cytopathogenic viruses recovered in 1955 and 1956 from the children with diarrhea included not only polioviruses and Coxsackie and ECHO viruses but also a small number of adenoviruses and some cytopathogenic, newborn-mouse-pathogenic viruses still to be identified. The adenoviruses and unidentified viruses just mentioned were not recovered from the control group. The incidence of the polioviruses and of the Coxsackie viruses was about the same in the control and diarrhea groups. On the other hand, the incidence of the ECHO viruses was six times higher in the 1956 group with diarrhea than in those without diarrhea. Furthermore, certain ECHO viruses, e.g., the five strains of ECHO 6 and the seven unclassified strains, were not encountered at all among the 100 children without diarrhea. The following types were encountered among the 42 ECHO strains recovered from the children

Table 3.—*Recovery of Viruses from Rectal Swabs of Children in Diarrhea and Control Groups During Different Months of Summer of 1956 in Cincinnati*

	Diarrhea			No Diarrhea		
	No.	Positive		No.	Positive	
Month	Tested	No.	%	Tested	No.	%
June	5	1	20	6	0	0
July	34	12	35	33	6	18
Aug.	58	34	59	61	14	23
Total	97	47	48	100	20	20

with diarrhea in 1955 and 1956: II, 1; VI, 7; VII, 11; VIII, 3; X, 1; XI, 2; XII, 3; XIV, 5; XVIII, 1; XIX, 1; and unclassified, 7. Subsequent work by Dr. R. Wigand in this laboratory indicated that six of the seven unclassified strains form three new, antigenically distinct types of ECHO virus. Thus representatives of 13 distinct antigenic types of ECHO virus were associated with diarrheal disease in children during the summers of 1955 and 1956 in Cincinnati.

In a preliminary report[10] on the viruses recovered from the children with diarrhea in 1955, it was pointed out that six strains that could not be identified with available antiserums belonged to five serologically distinct types designated D 1 to D 5. Subsequent work on the D 1 virus, of which there were two strains, showed that it was a "prime" variant of ECHO 6 (see table 5). The prototype ECHO 6 antiserum with a homotypic titer of 1:500, originally used for the identification of the two D 1 strains, failed to neutralize them in a dilution of 1:10. More potent ECHO 6 antiserums used subsequently yielded titers that were 100 times lower against D 1 than against the prototype virus. On the other hand, an antiserum prepared against the D 1 virus yielded approximately similar titers against the prototype ECHO 6 virus as against itself. It is also noteworthy that one of the children from whom a D 1 strain was recovered developed antibody equally well for the prototype ECHO 6 and the homologous D 1 strain (table 5). That the D 1 virus actually represents an antigenically more complex member of the ECHO 6 group rather than a mixture of two viruses was indicated by tests with an antiserum prepared with D 1 progeny derived from two terminal dilution passages. This procedure had to be used because the virus did not produce plaques; this antiserum gave similar titers with the original as well as with the purified viruses. Similar as well as other patterns of antigenic variation within the ECHO 6 group have also been reported by Melnick[14] and Karzon[15] among strains recovered from patients with the aseptic meningitis syndrome.

The D 2 virus culture fluid was originally not neutralized by any of the available ECHO or cytopathogenic Coxsackie antiserums and was not pathogenic for newborn mice. However, when antiserums were prepared against both the unpurified and plaque-purified progeny of this virus in the course of studying it as a potentially new type of ECHO virus, it was found that the antiserums neutralized Coxsackie B 3 virus as well as the one being studied. Furthermore, it was subsequently possible to adapt the virus to newborn mice. This finding established two significant points: (1) that there are "prime" antigenic variants of Coxsackie B viruses, and (2) that some naturally occurring Coxsackie B 3 viruses may have such a limited pathogenicity for newborn mice even after passage in monkey kidney tissue culture that they behave like ECHO viruses.

The D 3 and D 4 viruses, after rigorous analysis, were established as new types—18 and 19, respectively—in the ECHO group.[4] The importance of establishing new types even when only a single strain has been isolated is exemplified by ECHO 18, which turned up as the sole cause of an epidemic in premature and full-term babies in New York in 1956.[16]

The D 5 virus produced a distinctive cytopathogenic effect, similar to that of ECHO 10, but it was not neutralized by the ECHO 10 antiserum originally available for its identification. Furthermore, an antiserum prepared against the D 5 virus failed to neutralize the ECHO 10 virus. Nevertheless, a

TABLE 4.—*Incidence of Different Viruses Among Cytopathogenic Agents Isolated from Rectal Swabs of Children With and Without Diarrhea*

	1955				1956							
	Diarrhea (56 Children)				Diarrhea (97 Children)				No Diarrhea (100 Children)			
	Strains, Total No.				Total Strains				Total Strains			
Virus Recovered	No.	%	Serologic Type	Strains, No.	No.	%	Serologic Type	Strains, No.	No.	%	Serologic Type	Strains, No.
Poliomyelitis	3	5	I	3	3	3	III	3	3	3	II	1
											III	2
Coxsackie	5	9	A 9	1	4	4	A 9	0	6	6	A 9	0
			B 2	2			B 2	0			B 2	0
			B 3	1			B 3	1			B 3	3
			B 4	1			B 4	1			B 4	2
			B 5	0			B 5	2			B 5	1
Unclassified mouse pathogenic*	3	5			1	1			0	0		
Adenoviruses	1	2	III	1	3	3	I	1				
							II	1	0	0		
							III	0				
							Not I to X	1				
ECHO	12	21	2	1	30	31	2	0	5	5	2	1
			8	1			6	5			6	0
			11	2			7	11			7	3
			12	3			8	2			8	0
			New types				14	5			14	1
			D-1 variant of ECHO 6	2								-
			D-3 ECHO 18	1			Unclassified	7			Unclassified	0
			D-4 ECHO 19	1								
			D-5 variant of ECHO 10	1								

* Tissue cultures pathogenic for newborn mice—not neutralized by antiserums for Coxsackie A 7, A 9, A 14, B 1 to B 5, or any of the ECHO antiserums.

highly potent ECHO 10 antiserum was found to neutralize the D 5 virus, although in a one-hundred-fold lower titer. Accordingly it was decided that this virus belonged in the ECHO 10 group, which has already been found to be antigenically heterogeneous. Evidence that the patient, and not the monkey kidney tissue culture, was the source of this virus and that the infection was concurrent with the disease was adduced by demonstration of a tenfold increase in antibody in the convalescent phase serum (see table 6).

TABLE 5.—*Antigenic Relationship Between D 1 and ECHO 6 Viruses*

	Serum Dilution Endpoint per 0.1 Ml. vs. Indicated Virus			
	ECHO 6 (D'Amori)		D 1*	
Antiserum	TCD_{50}	Titer	TCD_{50}	Titer
ECHO 6 (D'Amori)				
Melnick's monkey serum	100	500	32	<10
Wenner's monkey serum	64	16,000	320	160
ECHO 6 (D'Amori) Cincinnati rabbit serum				
Before immunization	100	0	20	0
After immunization	100	1,600	20	16
D 1* Cincinnati rabbit serum				
Before immunization	32	<5	32	<5
After immunization	32	160	32	100
D 1* patient				
1 day after onset of disease	20	10	32	<5
10 days after onset of disease ...	20	100	32	16

* Case 12 (table 7).

If the children were mere carriers of these viruses while the diarrheal illness had some other etiology, one would expect in many instances to find almost maximum levels of antibody for the recovered viruses at the onset of the disease. Table 7 presents the results of tests for antibody on the acute and convalescent phase serums of 24 infants with diarrhea against the various enteroviruses that were recovered from them shortly after onset of illness. It is noteworthy that in each case there was little or no demonstrable antibody in the acute phase serum while antibody of varying levels, some low and some high, appeared during convalescence. It is furthermore noteworthy that this is true not only of the ECHO viruses, which were isolated with very much higher frequency from the diarrhea than from the control group, but also for the cytopathogenic Coxsackie and polioviruses which occurred with equal frequency in both groups.

To obtain some idea of the number of acute infections that may have been missed by using only rectal swabs for isolation of virus, acute and convalescent phase serums from 35 children with diarrhea whose rectal swabs yielded no virus were tested against only a few of the enteroviruses that were recovered in 1955 and 1956. The results shown in table 8 indicate that in seven of these patients (20%) there was evidence of concurrent acute infection, and it is not improbable that a much higher percentage would have been positive if a much larger number of the enteroviruses and also adenoviruses had been used for such tests. This means that the total incidence of infection with enteroviruses and perhaps also adenoviruses was considerably greater than indicated by recovery of virus from the rectal swabs.

Although the incidence of all enteropathogenic Esch. coli was not significantly different in the two groups, the data presented in table 9 indicate that type 0.111 B 4 was six times more frequent in the children with diarrhea and constituted about 62% of the 26 strains recovered from this group. Furthermore, 6 of the 13 strains recovered from the children without diarrhea belonged to types 0.125 B 15 and 0.119 B 14 which were not recovered at all from the children with diarrhea. Thus, the analysis of the results by individual serotypes indicates a more significant association of some of the enteropathogenic Esch. coli, especially 0.111 B 4, with diarrhea than was suggested by the undifferentiated data. The frequent association of 0.111 B 4 and 0.55 B 5 with infantile diarrhea has been reported by others.[17] Organisms belonging to the Shigella and Salmonella groups were not recovered from the children without diarrhea. Among the 11 strains recovered from children with diarrhea in 1955 and 1956, there were five Sh. flexneri, one Sh. sonnei, three Sal. paratyphi B, and two Sal. paratyphi C.

The data presented in table 10 indicate that (*a*) viruses as the sole agents were more frequently recovered from children with diarrhea (34% in 1955 and 35% in 1956) than were enteropathogenic bacteria without viruses; (*b*) while the incidence of pathogenic Esch. coli without viruses was the same in the diarrhea and control groups, double infections with viruses and Esch. coli were three times more frequent in the diarrhea group (15%) than in the control group (5%); (*c*) while the enteroviruses in the double infections with Esch. coli were all of the cytopathogenic variety (predominantly ECHO), the viruses found in conjunction with Esch. coli in the control group were all noncytopathogenic Coxsackie A viruses; and (*d*) the few children with diarrhea who yielded Shi-

TABLE 6.—*Antigenic Relationship Between D 5 and ECHO 10 Viruses*

	Serum Dilution Endpoint per 0.1 Ml. vs. Indicated Virus			
	ECHO 10 (Lang)		D 5*	
Antiserum	TCD_{50}	Titer	TCD_{50}	Titer
ECHO 10 (Lang) Cincinnati rabbit serum				
Before immunization	100	10	320	<5
After immunization	100	1,000	320	<5
Wenner's monkey serum	160	16,000	32	160
D 5* rabbit serum				
Before immunization	160	<5	32	<5
After immunization	160	<5	32	500
D 5* patient				
3 days after onset of disease			320	16
25 days after onset of disease ...			320	160

* Case 19 (table 7).

gella and Salmonella organisms had no associated viruses in 1956, while the double infections in 1955 again involved only cytopathogenic enteroviruses.

The enteroviruses associated with the two most prevalent types of enteropathogenic bacteria (0.111 B 4 and 0.55 B 5) are shown in table 11.

None of 153 children with diarrhea died. The incidence of various clinical manifestations observed among 66 children from whom viruses or enteropathogenic bacteria or both were recovered, summarized in table 12, indicates that (*a*) severe illness was least frequent among the children from whom only viruses were recovered, although 53% of this group were sufficiently ill to require hospitalization; (*b*) severe illness, with special reference to the extent of dehydration, was most frequent among the children infected with enteropathogenic Esch. coli—alone or in combination with viruses—and it is perhaps noteworthy that none of these had blood in their stools; and (*c*) blood in the stools occurred as often (20%) among those from whom only viruses were recovered as among those from whom only Shigella or Salmonella organisms were recovered (17%).

Table 7.—*Neutralizing Antibodies in Acute and Convalescent Phase Serums of Children with Diarrhea Against Viruses Recovered from Their Own Rectal Swabs*

Yr	Case No	Age, Mo	Virus Recovered	Days After Onset Serum Obtained: Acute	Days After Onset Serum Obtained: Conval	Antibody Titer/0.1 Ml: Acute	Antibody Titer/0.1 Ml: Conval
1955	1	9	Poliomyelitis 1	3	24	<5	160
	2	8	Poliomyelitis 1	?*	40†	<5	160
	3	17	Poliomyelitis 1	8	35	<5	160
	4	4	Coxsackie A 9	1	20	<5	160+
	5	19	Coxsackie B 4	3	39	<5	160+
	6	1	Coxsackie B 2	4	23	<5	160+
	7	8	Cytopathogenic, mouse pathogenic, mixture Coxsackie B3+ECHO	6	27	<5	16
	8	36	Cytopathogenic, mouse pathogenic, mixture Coxsackie A 9 + poliomyelitis 1	2	30	0	2
	9	3	ECHO 2	2	24	0	4
	10	1	ECHO 8	1	19	0	5
	11	5	ECHO 11	4	20	<5	16
	12	7	ECHO 12	9	33	<5	50
	13	3	ECHO 12	4	26	<5	160+
	14	3	ECHO 12	3	33	<5	160+
	15	2	D 1 antigenic variant of ECHO 6	1	18	<5	16
	16	9	D 1 antigenic variant of ECHO 6	6	29	<5	50
	17	8	D 3 ECHO 18	0	21	0	5
	18	2	D 4 ECHO 19	2	20	0	2
	19	30	D 5 antigenic variant of ECHO 10	3	25	16	160
1956	20	4	ECHO 6	?*	21†	0	4
	21	2	ECHO 6	1	25	<5	50
	22	9	ECHO 7	1	12	<5	5
	23	1	Coxsackie B 5	1	21	5	50
	24	2	Coxsackie B 4	1	15	0	4

* Day of onset of disease not established

† Number of days after obtaining acute phase serum specimen

Comment

The results presented in this communication raise the question of the etiological significance of the various viruses that have been recovered from infants and children with summer diarrheal diseases. On the basis of the comparative frequency of isolation from children with diarrhea and from the control group without diarrhea at the time of sampling, a significant etiological role may be assigned only to the viruses of the ECHO group, which were recovered six times more often from the children with diarrhea.

Table 8.—*Serologic Studies on Patients with Diarrhea from Whom No Virus Was Recovered*

Yr	Patients Tested, No	Virus Used in Neutralization Test	No Patients Developing Significant Rise in Neutralizing Antibody During Convalescence	Total: No	Total: %
1955	18	Poliomyelitis 1	1		
		Coxsackie A 9	1		
		ECHO 12	1	3	16.6
		D 4, ECHO 19	0		
		D 5 variant of ECHO 10	0		
1956	17	Poliomyelitis 3	0		
		ECHO 6	0		
		ECHO 7	4	4	23.5
		ECHO 8	0		
		ECHO 14	0		

Although the polioviruses and cytopathogenic Coxsackie viruses were recovered with the same frequency in both groups, one cannot say that they were not responsible for the illness observed in the children from whom they were isolated for the following reasons: (*a*) all of these viruses are *already known to produce a spectrum of clinical* manifestations ranging from minor illnesses, of which diarrhea may be an occasional manifestation, especially in infants, to more severe disease with varying degrees of involvement of the central nervous system, as well as completely inapparent infections; (*b*) the diarrheal illness was shown to be concurrent with an acute infection of these viruses as was shown by the development of neutralizing antibodies during convalescence; and (*c*) although some of the children in the control group from whom these viruses were recovered may indeed have had only an inapparent infection, it is possible that others might have had some illness with or without diarrhea subsequent to the time of sampling.

The same considerations may apply to the noncytopathogenic Coxsackie A viruses which were found with a similar low frequency in both groups, since Coxsackie A viruses have already been established as the cause of some summer febrile illnesses including the syndrome of herpangina, and here again it is possible that when such infections occur in very young infants that diarrhea and vomiting may become the predominant clinical manifestations. Some of the adenoviruses also seem to have a predilection for spreading during the summer months with the production of the syndrome, designated as pharyngoconjunctival fever, in which conjunctivitis may not however always be present while abdominal pain, vomiting, and diarrhea may not infrequently become prominent clinical manifestations.[18] It is of interest, therefore, that in both 1955 and 1956 the rectal swabs from children with diarrhea, but not from those in the control group, yielded a small number of adenoviruses when cultured on a medium that is least suitable for the isolation of these viruses; had we used HeLa cells and serologic tests for detection of infection with these viruses, it is not improbable that adenoviruses might have accounted for a larger proportion of the viral infections.

TABLE 9.—*Incidence of Various Types of Pathogenic Esch. Coli Among 26 Strains Recovered from Children With Diarrhea and 13 Strains Recovered from Children Without Diarrhea, Cincinnati, Summer of 1956*

	No. strains and % Incidence in Indicated Group			
	Diarrhea, 86 Tested		No Diarrhea, 64 Tested	
Serologic Type	No.	%	No.	%
0.111 B 4	16	19	2	3
0.55 B 5	5	6	2	3
0.26 B 6	1	1	2	3
0.127 B 8	1	1	1	1
0.125 B 5	1	1	0	
0.86 B 7	1	1	0	
0.126 B 6	1	1	0	
0.125 B 15	0		4	6
0.119 B 14	0		2	3
Total	26	30	13	20

Although the ECHO viruses, as a group, were more frequently associated with diarrheal disease than any of the other groups of viruses or bacteria, 13 different types were represented among the 42 strains that were recovered from the children with diarrhea. Although ECHO types 6, 7, and 14 were encountered more frequently (23 of 42) than the other 10 types (18 of 42), this may only reflect the fact that these viruses were being more extensively disseminated than the others during the years of our study in Cincinnati. That one cannot dismiss as insignificant a type of ECHO virus that may have been recovered only once from the children with diarrhea is emphasized by observations on ECHO type 18. It was recovered as an unclassified virus from an 8-month-old baby with diarrhea in the 1955 study, and remained the only strain of its type among all ECHO viruses recovered in our study. However, an outbreak of diarrhea among premature and full-term infants at the New York Hospital–Cornell University Medical Center during the summer of 1956 was shown by Eichenwald and associates[16] to have been caused solely by ECHO type 18 virus; 15 strains recovered from sick infants and 2 strains recovered from two of the attending nurses, who were apparently the healthy carriers, were all ECHO 18, and it is noteworthy that there was no evidence of inapparent infection with this virus among the other infants on the same wards who remained well.

The results obtained in this study of summer diarrheal disease are in many respects similar to those obtained in studies on the aseptic meningitis syndrome which has been etiologically associated with a very large number of distinct and unrelated viruses as well as with leptospira and protozoa. However, in the case of summer diarrheal disease we cannot even speak of a clinical syndrome, any more than we can speak of fever and headache as a syndrome, because diarrhea and vomiting are clinical manifestations of acute illnesses caused by a very large number of totally distinct etiological agents. The summer months in temperate zones are particularly conducive to the dissemination of enteropathogenic bacteria and viruses, which, especially in infants under one year of age, tend to produce acute, transitory illnesses with or without fever in which vomiting and diarrhea become prominent clinical manifestations. It is of interest, therefore, that by using only single rectal swabs and only two methods for virus isolation and very limited serologic tests, we have been able to associate enteropathogenic bacteria or viruses with approximately 80% of the 97 cases of summer diarrheal disease encountered among young infants and children in Cincinnati in 1956, the distribution being approximately as follows: enteropathogenic bacteria only (including Esch. coli, Shigella, and Salmonella), 22%; enteropathogenic viruses only (including ECHO, Coxsackie A and B, polioviruses, and adenoviruses), 44%; and double infection with enteropathogenic bacteria and viruses, 15%.

TABLE 10.—*Incidence of Dual and Single Infections With Viruses and Pathogenic Bacteria Among Children With and Without Diarrhea During the Summer of 1955 and 1956 in Cincinnati*

	1955			1956					
	Diarrhea			Diarrhea			No Diarrhea		
		Positive			Positive			Positive	
Agent	No. Tested	No.	%	No. Tested	No.	%	No. Tested	No.	%
Viruses only	56	19	34	97	34	35	100	17	17
Pathogenic Esch. coli only	15	1	7	86	13	15	64	10	16
Pathogenic Esch. coli and viruses	15	2*	13	86	13†	15	64	3‡	5
Salmonella only	41	1	2	86	4	5	64	0	
Shigella only	41	1	2	86	2	2	64	0	
Shigella and viruses	41	3§	7	86	0		64	0	
Salmonella and viruses	41	0		86	0		64	0	

* Associated virus infections were 1 ECHO 12 and 1 ECHO 18.

† Associated virus infections were 5 ECHO 7, 1 ECHO 14, 3 ECHO (unclassified), 1 poliomyelitis (type 3), 1 Coxsackie B 5, and 2 cytopathogenic-newborn mouse pathogenic (unclassified).

‡ Associated virus infections were 3 Coxsackie A (not cytopathogenic for monkey kidney—not typed).

§ Associated virus infections were 1 ECHO 11, 1 Coxsackie B 2, and 1 cytopathogenic-newborn mouse pathogenic (unclassified).

Summary

The incidence of infection with various enteropathogenic viruses and bacteria was determined in 153 infants and children with diarrheal disease during the summers of 1955 and 1956 in Cincinnati, and in 1956 also in a simultaneously sampled control group of children without diarrhea matched for age and socioeconomic status. Approximately 75% of the children were under one year of age. Monkey kidney tissue cultures and inoculation of newborn mice were the only methods used for recovery of viruses from rectal swabs obtained only once shortly after onset of illness. A large variety of enteroviruses (ECHO, Coxsackie A and B, polioviruses) and a small number of adenoviruses were recovered from about 50% of the children with diarrhea, and limited serologic tests indicated that acute viral infections also occurred in many children from whom no viruses were recovered. The ECHO viruses were predominant and their incidence was six times greater in the diarrhea group than in the control group, while the incidence of the Coxsackie A and B viruses and of the polioviruses was similar in both groups. Serologic tests on acute and convalescent phase serums indicated, however, that the diarrheal illnesses were associated in time with the onset of infections by the Coxsackie and polioviruses which are already known to produce a broad spectrum of clinical manifestations in human beings. Thirteen different serologic types were represented among the 42 ECHO viruses that were recovered from children with diarrhea.

Shigella and Salmonella organisms were recovered from only 9% of the children with diarrhea and from none of those without diarrhea. While the incidence of all enteropathogenic Esch. coli was not significantly greater in the diarrhea group (30%) than in the control group (20%), the serotype 0.111 B 4, which constituted 62% of all the recovered strains, was six times more frequent among the children with diarrhea; on the other hand, serotypes 0.119 B 14 and 0.125 B 15, which constituted about 50% of the strains recovered from the children without diarrhea, were not found at all among the children with diarrhea. Double infections with enteropathogenic bacteria and viruses were also encountered.

Table 11.—*Association of Most Prevalent Types of Pathogenic Esch. Coli and Various Viruses in Children with Diarrhea During Summer of 1956 in Cincinnati*

		No Strains Associated with Indicated Virus											
		ECHO 7		ECHO 14		Coxsackie B5		Unclassified		Poliomyelitis		Total	
Serologic Type	Strains, No.	No.	%	No	%	No.	%	No.	%	No.	%	No.	%
0.111 B4	16	5	31	1	6	1	6	1*	6	0	0	9	56
0 55 B5	5	0	0	0	0	0	0	1†	20	1	20	2	40

* Cytopathogenic, newborn mouse pathogenic agent.
† Unclassified ECHO virus.

The results of the present study seem to warrant the conclusion that summer diarrheal disease in very young children is not an entity but rather a consequence of transitory infections with a large variety of enteropathogenic viruses and bacteria that are especially prone to produce diarrhea and vomiting as part of the clinical manifestations of infection in very young infants. Despite the limited methods we employed, it was possible to associate enteropathogenic viruses or bacteria or both with at least 80% of the 97 cases of summer diarrheal disease studied in 1956, the distribution being approximately as follows: enteropathogenic bacteria only (including Esch. coli, Shigella and Salmonella), 22%; enteropathogenic viruses only (including ECHO, Coxsackie A and B, polioviruses and adenoviruses), 44%; and double infection with enteropathogenic bacteria and viruses, 15%. None of the children died, and the disease was generally milder among the children from whom only viruses were recovered, although 53% of them were sick enough to require hospitalization.

Table 12.—*Incidence of Most Common Clinical Manifestations in Patients with Diarrhea from Whom Viruses or Pathogenic Bacteria or Both Were Recovered During Summer of 1956 in Cincinnati*

		% in Indicated Category					
Agents Recovered	No.	Hospitalization	Fever	Vomiting	Dehydration	Mucus in Stools	Blood in Stools
Viruses only	34	53	62	62	29	44	20
Pathogenic Esch. coli only	13	77	77	85	85	15	0
Viruses and pathogenic Esch. coli	13	92	61	61	92	23	0
Shigella or Salmonella ...	6	83	83	67	33	33	17

Addendum

Our associate, Dr. Hans J. Eggers, recently completed an analysis of the four unclassified, cytopathogenic, newborn mouse pathogenic strains listed in table 4 and found that the three 1955 strains consisted of (1) a mixture of Coxsackie A 9 and poliovirus 1, (2) a mixture of Coxsackie B 3 and an ECHO virus, and (3) an antigenic relative of ECHO 10; the 1956 strain proved to be a mixture of Coxsackie A 9 and B 4.

The Children's Hospital Research Foundation, Elland Avenue and Bethesda (29) (Dr. Sabin).

This study was aided by a grant from the National Foundation for Infantile Paralysis.

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TREATMENT OF THE ACUTE COMPLICATIONS OF CHRONIC ALCOHOLISM

USE OF AZACYCLONOL (FRENQUEL) HYDROCHLORIDE IN ONE HUNDRED CONSECUTIVE CASES

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The responses of 100 chronic alcoholic patients with acute complications were studied with respect to azacyclonol hydrochloride, a drug with marked antihallucinatory effect. It was given by mouth, generally in doses of one 100-mg. tablet four times a day, in addition to the medication usually given to patients who are psychologically and biologically in extremis. Of the 75 who had hallucinations, 60 recovered quickly and 8 were improved. The effects are illustrated by two case histories. By treating this group of patients successfully while they were in extreme situations, rapport and confidence were established which formed the basis for more definitive treatment of the patient's total problem. Hospitalization might have been useful in many cases, but it is believed that azacyclonol was of considerable help in treating these people at the outpatient level.

Where patients are received in a clinic such as the Adult Guidance Center, which is dedicated to the treatment of those who have a drinking problem, someone frequently arrives who is in biological and psychological extremis. This patient may be suffering from symptoms of starvation and dehydration as well as from confusion, extreme restlessness, hallucinations, nightmares, and autonomic nervous system syndromes indicating near collapse. Our clinic is not devoted to the drying out process only. We believe, however, that by treating this group of patients successfully while they are in extreme situations, rapport and confidence can be established which will be the foundation for more definitive treatment later of the total problem the patient brings. Some of our general policies and procedures have been described by Peltenburg[1] and Quiros,[2] and will not be covered in this paper.

In the course of assaying the value of new medicaments as they become available, azacyclonol (Frenquel) hydrochloride was tried, but little or no success was achieved in its use until the correct dosage had been determined. When this was estab-

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lished, through the reports of several investigators,[3] considerable success was achieved. Indeed, studies were begun on a series of 100 patients in order to verify our early nonstatistical conclusions regarding the benefit derived from azacyclonol.

Plan of Treatment

The drug was to be given primarily to those who had hallucinations; secondarily, to those who had such severe nightmares that sleep was too interrupted for adequate rest; and thirdly, to those who suffered from and admitted confusion of mentation.

The following statistics were kept in punch-card form, care being taken not to assay the treatment until at least two weeks had passed from the time it was begun: name, clinic number, date of initiation of treatment, age, sex, occupation, interval since last employment, date of return to work, marital status, number of marriages, interval since the last drink, length of binge, number of times delirium tremens had been experienced on previous occasions, type of hallucination and the period of the day when present, nightmares, confusion, psychiatric diagnosis (according to American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders, 1952), physical diagnosis, dosage method, frequency of administration of azacyclonol, adjunctive therapy, number of days of treatment with azacyclonol, results of treatment, and disposition of the patient at the end of treatment (or at time of statistical survey).

I did not diagnose and treat all of the patients recorded in this series; some were cared for by the seven psychiatrists and three internists on our staff. These physicians were told that a statistical assay was to be done and were instructed to note in the patients' folders certain facts, such as time of recovery from specific symptoms, return to work, and so on. They were not asked to code their opinions of the treatment.

A double-blind study was considered unnecessary, since this method of study had already been utilized by others.[4] Moreover, azacyclonol reverses electroencephalographic changes produced by *d*-lysergic acid diethylamide (LSD-25).[4b] We had previously observed the specific effect of azacyclonol in alcoholic patients receiving intravenous medicaments. In them, the drug relieves hallucinations, frequently before the needle is removed from the vein.

Numerical Assay

The series of patients was limited to exactly 100 so that numbers of patients would correspond to percentage of cases. The average age was 42.49 years, with extremes ranging from 27 to 66 years, and a standard deviation of 8.17 years, which correspond closely to the clinic general averages. The sex difference was 80 males to 20 females, a ratio of 4:1, which likewise is close to the clinic average. Only 38 of the group were married; of the 80 men, 35% were married, while of the 20 women, 60% were married. Of the whole group, 82 had been married at one time.

Occupationally, they were divided as follows, in order of frequency: craftsmen, 31; service, 19; labor, 15; professional and technical, 10; not in labor force, 7; clerical, 5; operative, 5; and sales, 4. Managerial personnel, entertainers, and farm groups supplied the remaining four.

In regard to length of the binge they had been on, 13 admitted 1 to 4 days; 13, 5 to 6 days; 15, 7 to 9 days; 16, 10 to 14 days; 12, two to three weeks; 4, three to four weeks; 4, four to five weeks; 4, five to six weeks; 3, six to eight weeks; 9, two to three months; 1, three to five months; and 3, over eight months. In three cases either the patients could not remember how long the binge had lasted or this fact was not recorded.

We questioned these patients concerning the interval between the time of the last drink and the time they sought help. Thirty-five were drinking when treatment was started; 33 took their last drink the day before; 20 had stopped in the previous 5 days; 3, a week prior to treatment; 6, 10 to 30 days before; 2, two to six months ago; and 1, a year ago. Those who had asked for treatment so long after cessation of drinking were not usually hallucinating but were complaining of extreme restlessness, bad dreams, or confusion, all leading to a desire to return to drinking and thus a return of the patient to a physician.

Statistics were kept regarding the time interval since last employment. Some of these are not pertinent here, but let it be noted that 10 of our group were employed at the time treatment was begun. This group of nine men and one woman included five persons who were actively hallucinating and three who were diagnosed as psychotic (only one of whom admitted hallucinations).

Our analysis of the number of times these patients had previously suffered delirium tremens referred usually to symptomatic and subjective statements concerning the frequency of occurrence of visual, auditory, or haptic sensations which could not be proved by them at the time and were thus considered subjective in origin. Sometimes the patients were sufficiently aware of the true meaning of delirium tremens to differentiate between it and hallucinosis, but not frequently. At any rate, 52 revealed that they had had delirium tremens 1 to 12 or more times before. Six in the group announced that there were too many times to recall.

In regard to physical illness occurring concomitantly with the psychiatric problem, 57 of the patients were found to have notable diseases or former operations of consequence. Peripheral neuritis led the list with 19 cases. There was evidence of fatty degeneration of the liver in eight, cirrhosis in four, and peptic ulcer in three. Gastrectomy had been performed in five. There was one case each of the following illnesses: bronchial asthma, recent head injury, arthritis, hypertension, cardiac decompensation, and gastritis. Since gastritis is almost constantly present in the patient after a recent severe drinking bout, had it always been noted per se, the incidence would have been much greater. Illnesses carded as miscellaneous totaled 12%.

Psychiatric disorders were as follows, in order of frequency: nonpsychotic diagnoses included passive-aggressive personality, 30; inadequate personality, 25; emotionally unstable personality, 9; schizoid personality and cyclothymic personality, 2 each; and drug addiction, 1. Psychotic diagnoses included chronic brain syndrome, 2; acute brain syndrome, 2; agitated depressions, 2; unclassified psychosis, 1; and schizophrenia, 12.

It should be noted that psychoses accounted for 19 of the total group and, in all but the 4 brain syndromes, were not directly resultant from alcohol imbibition. It should also be noted that our psychiatrists did not make one diagnosis of alcoholism per se in these 100 "alcoholics," although 5 were left undiagnosed. In a larger group, other personality disorders would have been seen.

Of the total group, 66 had auditory hallucinations, 41 had visual hallucinations, and 2 had haptic hallucinations alone. Seventy-five patients had hallucinations, which occurred at night in all cases and in the daytime as well in 49. Treatment was given to 25 other patients who seemed on the verge of hallucinating and complained of bad dreams, almost total insomnia, and confusion.

The medicament, azacyclonol, was administered almost uniformly in a dose of one 100-mg. tablet four times a day. This was done in 87 of the patients treated, 4 being treated on a three times a day basis, one twice daily, one five times daily, one on scattered dosage, four on intravenous plus four times daily by mouth basis, one orally at bedtime only, and one intravenously for only one dose. Thus, 91 were on oral medication four times a day after the initial dose.

The medicine was given only one day in 14 patients, 2 days in 18, 3 days in 25, 4 days in 15, 5 and 6 days in 11, and as long as 13 days in 7. Ten patients continued therapy for more than two weeks, since they wished to do so. Six of these 10 were psychotic and claimed relief. The relatively short period of treatment reflects the prompt response to therapy, since the drug was not continued more than a day after cessation of symptoms. Some of these patients after having taken azacyclonol requested that treatment be continued; others asked for the drug by describing the tablet after its use had been discontinued by the physicians.

In no case was azacyclonol used alone, save in initial intravenous injections. In all other situations it was used as an adjunct to our usual medication for patients in severe condition.

Results

Of the total group, 57 were considered recovered and 27 improved, or a total of 84 recovered or improved. At the time of assay, 51 were again employed. It is assumed that a larger percentage would be employed if a later assay had been done. Of the 100 patients, only 6 were sent to the hospital, 6 discontinued treatment, and 4 were unimproved. Most patients in these latter three groups continued to drink and were thus unchanged or worse after initiation of treatment. It was not believed that any patient was made worse by the treatment. Of the group of 75 who hallucinated, 60 (80%) recovered quickly and 8 (11%) were improved, totaling 91%.

Report of Cases

Case 1.—A divorced male of 46 years, a skilled laborer with a life-long history of alcoholism, reported to the clinic on March 28, 1957, after having been absent from treatment for 11 months. He stated that he had had difficulty in his relationship to a woman friend in that she began drinking. He, too, had been drinking for two weeks. He was very upset because of his current plight, as he was now friendless, jobless, almost totally insomnic, nauseated, anorexic, and uncontrollably shaky with profuse sweating, weakness, and exhaustion. He was treated immediately with parenterally given vitamins and dimenhydrinate (Dramamine), oral gastric sedatives, anesthetics, and a milk shake. He was given mephenesin (Tolserol), meprobamate, and barbiturates to take with him.

He returned the next day unimproved, and similar medicaments as well as adrenal cortical extract were given. The following day he returned on schedule, still miserable, insomnic, restless, and hallucinating. He complained of hearing doorbells and telephone bells which interrupted him repeatedly during the nights. At this visit, azacyclonol, 100 mg. four times a day, was ordered. On his next visit the following day, he reported being slightly less insomnic and was no longer hallucinating but he was still restless. Two days later he realized he was improving. "I'm coming around; I'm better, but still tense. I can't write yet," he volunteered. From then until the present writing, he has returned to the clinic about twice a week. He has been working steadily since April 10. Whether this patient could have been cared for in the clinic setting without the aid of azacyclonol is doubtful.

Case 2.—This patient, a professional man of 32 years, with a history of intermittent drinking since 1944, heavily enough to cause him to lose jobs during the past three years, had begun treatment at the clinic on Jan. 22, 1957. After a few visits he had discontinued treatment but not the drinking. As a result, he had to enter a sanitarium, where he remained 72 hours and then signed himself out. He returned to the clinic the next day, on March 11, 1957, in a very frightened and disturbed condition, stating that he had been having both visual and auditory hallucinations. He was able to maintain some sort of intellectual interest in the phenomena which occurred, but without avail, for he became frightened both of the sensations and of the fact that he had become sicker than he had realized. He was given azacyclonol, 100 mg. intravenously, and reported immediate cessation of the disturbing sounds and figures. He relaxed visibly as the medicine took effect, but consciousness appeared to improve rather than to diminish as in a sedative approach. He had been taking chlorpromazine (Thorazine), 300 mg. per day, and was allowed to continue this, with the addition of azacyclonol, sedatives, and vitamins. There were no further hallucinations, although he had kept everyone awake the previous night as he greeted people at the door, chased animals around the room, etc. He had ended up exhausted, frantic, and confused. He returned to work the day after azacyclonol was given intravenously, since he felt that he could afford no more time off the job. The hallucinations did not return. Azacyclonol was discontinued on the fourth day. He reported that he had received no specific treatment for his hallucinosis while in the sanitarium.

Comment

Differentiation between clearly demarcated delirium tremens and hallucinosis was not attempted. In an outpatient facility such as ours, continuous medical observation of the patient by trained personnel is not possible. The patient usually is cared for by a relative or a friend, but sometimes there is no one. Many of these patients recovered alone in their rooms, venturing out only to come to the clinic for treatment. Many had poor later recall of events leading up to their arrival at the clinic. Nearly all had been almost completely sleepless prior to arrival, but after treatment began to get sufficient rest for recovery. Sedation was almost uniformly used as part of the medical regimen, as were gastric anesthetics and sedatives, and mephenesin. A small percentage of patients received ataractic and tranquilizing medicaments, too. Some were given adrenal cortical extracts. One patient, addicted to both alcohol and amphetamine, experienced a reduction of hallucinations after intravenous administration of azacyclonol, but he could not maintain this reduction when the drug was given orally. This group of 100 patients were admitted to the clinic during the course of four and one-half months. They represent a relatively complete list of consecutively treated patients in a busy clinic. There were some, however, who were treated successfully in the same manner but who were not included in the series because of inadequate data in different areas, although their names were known; others failed to get on the roster and, therefore, could not be included.

While such patients have been treated without hospitalization more or less successfully in the past, the rate of success in this series was felt to be substantially increased and hastened by the use of azacyclonol. It is not meant here that we are against hospitalization of any patient who needs it, but rather it is believed that many physicians will find themselves in the position of having acutely sick patients who for reasons of indigency or lack of hospital beds cannot be treated in a hospital, and who therefore need the extra assistance of the type offered by this drug. Many more of these patients should have been hospitalized; perhaps all of them would have benefited by such care. It was not available to them for the following reasons: (1) actual lack of hospital space; (2) the patient's own reluctance to accept charity care; (3) fear of being committed to a state hospital as a result of his local hospitalization; and (4) unwillingness to afford the luxury of time off work.

Most of these patients were seen daily or twice daily in the clinic for the first several days. The psychiatric diagnosis was usually determined prior to the acute illness (as on a former admission) or after the early episode.

Conclusions

It has been shown that of 100 acutely ill patients suffering from the acute complications of prolonged alcoholic intoxication, most could be treated successfully as outpatients. Azacyclonol is of considerable help in the treatment of such patients in any situation, primarily through shortening the recovery period and making it tolerable. (If the recovery period is not tolerable, such patients use alcohol as a sedative or hypnotic, thereby really protracting and increasing the total illness.) Azacyclonol injected intravenously reduces fear and anxiety immediately by halting the hallucinatory images or sensations; when given by mouth, it appears to achieve the same result in similar but somewhat slower fashion. Sociological, biographical, and medical data have been offered to suggest a picture of the patients. The oral dose of azacyclonol was 100 mg. four times daily in most cases. The duration of administration of the drug as determined by recovery from the symptoms was generally less than four days.

150 Otis St. (3).

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J.A.M.A., May 10, 1958

METHOCARBAMOL—NEW AGENT IN TREATMENT OF NEUROLOGICAL AND NEUROMUSCULAR DISEASES

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and
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If one accepts the theory that spasticity is the result of the release of the spinal cord from the inhibition of higher centers, in both the brain stem and cortex, resulting in a sustained reflex increase in tonus, extensor in the lower and flexor in the upper extremities, then it will be seen that a drug, to be effective, must either restore the "inhibition" to the cord or break up the sustained reflex activity. The ideal lissive agent should have a long therapeutic effect, be available in an oral preparation, and, if side-effects are present, have a ratio between toxic and therapeutic dosage great enough that the side-effects are not more incapacitating than the primary condition. With methocarbamol a good result was obtained in 72% of patients with both acute and chronic spasm. An improvement in all patients with incoordination was observed. Methocarbamol is of value in muscle spasm and severe flexor spasms accompanying cord disease and has as well a more limited use in the treatment of incoordination.

The need for a substance which would reduce spasticity, rigidity, and muscle spasm, as well as prevent the formation of contractures in neuromuscular diseases, has led to the investigation of several agents which were purported to have a beneficial effect on spasticity without causing a proportionate weakness, that is, not changing a spastic weakness into a more disabling flaccid weakness. The term "lissive" has been used to designate this action.[1]

Up to this point the promising group of substances has been mephenesin, meprobamate, and zoxazolamine. There has been some disappointment regarding the effectiveness of these preparations. The results vary greatly as to the type of observation and type of patients and whether spasticity arises from the supraspinal or spinal levels. Unfortunately, most observations must be subjective. There is no good objective test to evaluate the effect of drugs clinically. While the electromyogram offers a direct measurement test, to be really objective it should be done at regular intervals and not just at the time the drug is administered intravenously. This is difficult to arrange for a large number of patients.

Many drugs are effective in reducing spasticity for short periods but must be given in high doses, and usually the effects wear off too quickly to be of value. To be effective, then, the ideal lissive agent should have a long therapeutic effect, be available in an oral preparation, and, if side-effects are present, have a ratio between toxic and therapeutic dosage great enough that the side-effects are not more incapacitating than the primary condition.

In view of the large number of patients who have neuromuscular and neurological diseases and the minimal effectiveness of preparations presently available, new pharmacological fields must be plowed until the ideal drug is found, since it is not likely that surgical procedures, at least in the case of spasticity, will ever be the complete answer. Consequently, we have studied the effectiveness of a new preparation, methocarbamol, on a new group of patients with neuromuscular and neurological diseases.

Methocarbamol (Robaxin) is 3-o-methoxyphenoxy-2-hydroxypropyl-1-carbamate. It is derived from guaiacol glyceryl ether, and the skeletal muscle relaxing properties of the parent compound were described by Ginzel.[2] The pharmacodynamic studies performed by Truitt[3] demonstrated that methocarbamol produced a prolonged relaxing effect on skeletal muscle through a depression of spinal multisynaptic pathways with no effect on monosynaptic reflexes. Solomon[4] observed that methocarbamol had no effect upon motor nerves, muscle, myoneuronal junction, or monosynaptic arcs. These studies confirmed the observation of Truitt that the site of action of methocarbamol is at the interneuronal junction in the spinal cord. Morgan and associates[5] reported determinations of plasma levels of methocarbamol in the dog after oral and intravenous administration.

These voluntary muscle relaxing qualities, in addition to the wide therapeutic range, suggested the clinical application of methocarbamol in a wide variety of neuromuscular disorders. To a selected group of patients the drug was administered in a dosage from 1 to 4 Gm. daily in divided doses. No patient is included in this report who was on the medication less than two months if his condition was chronic and two weeks if his condition was acute, unless recovery occurred promptly. The ma-

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jority of the patients with severe spasticity and contractures received the preparation for six months to a year.

Patients were selected to include a representation of the main problems of neurological and neuromuscular disease, namely (*a*) spasticity, represented by patients with multiple sclerosis, primary lateral sclerosis, traumatic spinal cord disease, and heredofamilial degenerative disease; (*b*) rigidity, as seen in Parkinsonism; (*c*) contractures, as seen in muscular dystrophy; (*d*) incoordination, as found in such spinocerebellar and cerebellar diseases as multiple sclerosis and heredofamilial degenerative disease; and (*e*) muscle spasm, as in poliomyelitis, fibromyositis, and secondary to herniated nucleus pulposus. There were 70 patients and 75 trials performed. The distribution of clinical trials is seen in the table.

Results According to the Major Symptomatic Problem

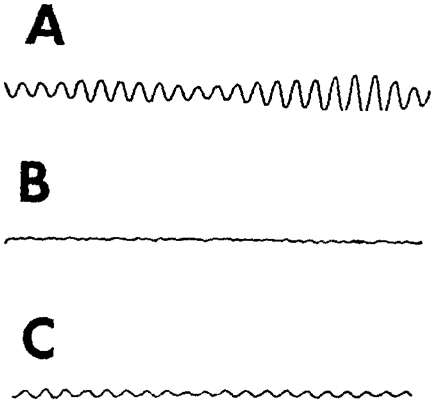
Spasticity.—Eighteen patients had spasticity of a severe degree as the primary problem. These included some patients with multiple sclerosis whose weakness was not in proportion to the degree of spasticity and the traumatic paraplegias where spasticity was both incapacitating and accompanied by a severe reflex muscle spasm. Since there are no foolproof methods to objectively evaluate the results of treatment in spasticity we use the following criteria: (1) the appraisal, by the patient himself and members of the family, of the patient's progress and decrease in pain, and (2) the grading of spasticity and reflex change by the examiner. To eliminate as far as possible the difference in interpretation between examiners, patients were followed by a single examiner.

Distribution of Patients and Results of Seventy-five Clinical Trials with Use of Methocarbamol

			Results			
Symptoms	Diagnosis	Patients, No.	Good	Fair	Poor	Improved, %
Spasticity	Multiple sclerosis	12				
	Primary lateral multiple sclerosis	2				
	Adhesive arachnitis	1				
	Traumatic paraplegia	3				
		18	0	0	18	0
Rigidity	Parkinsonism	4				
	Cephalic tetanus	1				
		5	0	1	4	25
Contractures	Muscular dystrophy	19	0	0	19	0
Incoordination	Spinocerebellar ataxia	2				
	Multiple sclerosis	6				
		8	4	4	0	100
Muscle spasm*	Acute	17	17	0	0	100
	Chronic	8	0	0	8	0
		25	17	0	8	72

* Muscle spasm group included diagnoses of herniated disk, fibromyositis, torticollis, and poliomyelitis

Using the above criteria, no patient was considered to have had more than a moderate decrease in spasticity. If any change occurred it was not enough to be of clinical advantage. On the other hand, the painful reflex spasms seen in four patients with severe pyramidal tract disease were completely eliminated in one patient and markedly decreased in two others, representing an improvement in three of four cases. No patients developed an increase in weakness such as we have observed and which has been reported in the use of some other lissive agents.[6] Generally, the reflexes were unaffected except in one patient with multiple sclerosis in whom Babinski signs and hyperactive knee jerks disappeared during treatment and gradually returned when the therapy was discontinued.



Tremogram showing effect of methocarbamol on rate and amplitude of typical Parkinsonian tremor. *A*, before intravenous administration. *B*, pattern starting 15 minutes after injection and lasting one to one and one-half hours. *C*, two hours after injection.

Rigidity.—Four patients with Parkinsonism and one patient with cephalic tetanus were included in this study. In the former patients there was subjective improvement in one patient but no sustained improvement in the rigidity. Intravenously administered methocarbamol in one patient had a definite short effect on the severe tremor; however, prolonged treatment with the oral preparation was ineffective. A tremogram is shown in the figure, indicating a transient effect on the tremor in this patient. The patient with cephalic tetanus was graded as having 40% total improvement when sustained on intravenous injections. He was not sustained by oral medication.

Contractures.—Nineteen patients with muscular dystrophy and various stages of contracture ranging from tightness of the Achilles tendons and the iliotibial bands to severe deforming contractures were treated for over one year with methocarbamol. At the end of that time 7 remained the same and 12 had become worse. Comparing these results with another experimental preparation used in the same way, the results were approximately the same.

Incoordination.—Of eight patients in whom cerebellar signs were marked, four showed a noticeable improvement in speech and ability to perform coordinated actions. Obviously it is impossible to quantitate this improvement; however, in two patients who improved, there was regression with withdrawal of the drug and reimprovement on return to the therapeutic regimen.

Muscle Spasm.—Twenty-five patients were represented in the group with muscle spasm. In 18 cases of acute disease there were excellent results. These included six cases of herniated lumbosacral disk and eight cases of acute fibromyositis from either trauma or inflammation. These patients had alleviation of symptoms promptly, and the results were lasting with an average total dose of 4 Gm. Moderate relief occurred in two cases of herniated disk and one case of poliomyelitis. In one case of spasmodic torticollis secondary to herpes zoster involving cervical roots, retreatment was necessary after an initial relief. In seven cases, which included two cases of torticollis and four cases of chronic fibromyositis of the cervical tension type, there was no remarkable relief. The results are summarized in the table.

Comment

The problem of alleviating spasticity is an extremely complex one. If one accepts the theory that spasticity is the result of the release of the spinal cord from the inhibition of higher centers, both in the brain stem and cortex, resulting in a sustained reflex increase in tonus, extensor in the lower and flexor in the upper extremities, then it will be seen that a drug, to be effective, must either restore the "inhibition" to the cord or break up the sustained reflex activity. Since this inhibition comes from many areas, e. g., cortex, reticular substance of the brain stem,[7] basal ganglions,[8] and cerebellum, it would require that a drug have a selectivity for these areas to show any degree of effectiveness. There is, however, the possibility that certain lesions may be more likely to respond to centrally acting agents, and indeed this is true clinically. Spasticity from lesions of the cortex is less severe than that of subcortical origin.[9] Furthermore, the spasticity resulting from cortical lesions, as seen in cerebral palsy, have been the most responsive to the use of lissive agents.[10] This, however, may not be due necessarily to the selectivity of the drug, since it is well known that the spastic hemiparesis resulting from lesions occurring in childhood is quantitatively different from that which occurs in adult life. This has been postulated as being the result of the development of ipsilateral innervation.[11]

It is further evident that with spinal cord lesions no drug, whether acting on multineuronal or monosynaptic circuits, is likely to have much effect unless it affects the overactive reflex pattern at the segmental level. Morphine and codeine seem to be effective here, but, due to the dangers inherent in their use, they are not ideal drugs for long-term therapy. Perhaps the ideal medicament would be a combination of synthetic opiate derivatives, which have been discarded because of lack of central effect, together with the central relaxants or lissive agents.

Rigidity poses a problem different only in that it results from activity, or lack thereof, above the cord. The pathophysiological mechanism is not fully understood, however, it is certain again that we are dealing with multisynaptic mechanisms. We are further along in our knowledge of the treatment of rigidity than of spasticity since the anti-Parkinson drugs have proved to be useful in the reduction of rigidity in patients with Parkinsonism, at least in the early and milder stages. Furthermore, surgical procedures on a single level, such as chemopallidectomy, have ameliorated the symptoms of rigidity in a significantly high percentage of cases.[12]

Muscle spasm is closely related to spasticity in some respects but different mainly in that there is no full or permanent loss of higher center inhibition to the cord, and hence it is not truly a state of uninhibited, increased stretch reflex. A possible explanation is that the spasm may be the result of maintained tension as a reflex response to pain.[13] In any case the response to lissive agents is much more gratifying here than in the case of spasticity and rigidity. In the case of contractures it is easily understood why no response is obtained. These cases represent structural defects rather than increase in tonus on reflex basis. Therefore, drugs acting on the brain or cord would have little effect in restoring normal elasticity.

A noticeable improvement in cerebellar signs with methocarbamol is difficult to understand unless one considers that cerebellar abnormality may be an overplay on the "input" or sensory side resulting in exaggerated efferent activity. If this is true, the effect of the medication may be the blocking of multisynaptic systems with reduction of a sensory "shower" to the cerebellum. This is only one of the many areas which will need investigation before our understanding of the physiology or treatment of these symptoms is complete.

Summary

The results of methocarbamol (Robaxin; 3-o-methoxyphenoxy-2-hydroxypropyl-1-carbamate) administration were evaluated in 75 trials performed in 70 patients with skeletal muscle hyperactivity secondary to neurological disorders. Efficacy of drug administration was determined by the degree of change in major symptomatology, such as spasm, incoordination, contractures, rigidity, and spasticity. An excellent result, after methocarbamol administration, was obtained in all patients with acute skeletal muscle spasm. A good result was obtained in 72% of the patients with both acute and chronic spasm. An improvement in all patients with incoordination was observed. This response was considered good in one-half of the group and fair in the others. At the dosage administered (1 to 4 Gm. per day) failures were noted in all patients studied with contractures, rigidity, spasticity, and chronic fibromyositis. Methocarbamol is of value in muscle spasm and severe flexor spasms accompanying cord disease and has as well a more limited use in the

treatment of incoordination. Further investigation regarding this and similar drugs is warranted in the investigation of treatment for spasticity and rigidity.

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The methocarbamol used in this study was supplied as Robaxin by the A. H. Robins Company, Inc., Richmond, Va.

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METHOCARBAMOL (ROBAXIN) IN ORTHOPEDIC CONDITIONS

PRELIMINARY REPORT OF ONE HUNDRED CASES

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The ability of methocarbamol to relax spastic muscles was noted incidentally to other studies, but was found to merit special investigation. The effects here reported were obtained in 58 patients with acute orthopedic conditions (especially herniated lumbar and cervical disks) causing painful muscular spasms, 7 patients with chronic conditions, and 18 patients recovering from orthopedic surgery. The average oral dose of methocarbamol was 6 Gm. per day in divided doses, using 500-mg. scored tablets. The relief from pain was often prompt and striking. The resultant facilitation of treatment and hastening of recovery is exemplified in four case histories. Side-effects were minor, but occasionally made it necessary to reduce or interrupt medication. Methocarbamol was particularly useful in such procedures as reducing dislocated shoulders without anesthesia and manipulating spastic feet.

During pharmacological studies of methocarbamol (Robaxin) at the Bowman Gray School of Medicine, the drug was administered to a laboratory technician who was suffering from a herniated cervical disk. The relief of pain and muscle spasm in this patient (who had not responded to conservative measures prior to drug therapy) was so significant that additional clinical trials were instituted. The results observed with this compound in 100 patients are the basis of this report.

The problem of pain due to involuntary spasm of skeletal muscle is one that frequently confronts the orthopedic surgeon. This spasm usually arises as a protective mechanism when the body attempts to splint a part that would be painful if moved. In time the muscle spasm itself may become painful, and contribute as much or more to the patient's discomfort as the original condition. Consequently, an important part of the treatment of many orthopedic conditions or injuries is directed toward the relief of pain due to muscle spasm. Furthermore, spasm of the surrounding musculature frequently interferes with the reduction of a fractured bone, a dislocated joint, or a herniated disk.

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Recently, a number of new drugs have been introduced which have the property of relaxing the involuntary contraction of these skeletal muscles to a variable degree. Unfortunately, most of these drugs have unpleasant or undesirable side-effects which make them less useful or somewhat hazardous.

In my clinical experience, methocarbamol has afforded greater relief of muscle spasm and pain for a longer period of time without undesirable side-effects or toxic reactions than any other commonly used relaxants such as mephenesin, meprobamate, zoxazolamine, or chlorpromazine.

Pharmacology

Methocarbamol [3-(o-methoxyphenoxy)-2-hydroxypropyl-1-carbamate] was synthesized by Murphey in 1953.[1] The pharmacological actions of this compound were determined by Truitt and Little [2] at the Bowman Gray School of Medicine. They demonstrated that methocarbamol inhibited polysynaptic spinal reflexes while it had no effect on monosynaptic reflex arcs. Their studies indicated that this drug did not directly influence skeletal muscle and that voluntary muscular relaxation was a result of a selective action of this compound upon the central nervous system. They recognized its possible use as an effective and safe skeletal muscle relaxant and suggested that I use it clinically.

Selection of Patients

The present study carried out during the past year comprises a clinical evaluation of 100 patients suffering from painful conditions of an orthopedic nature. Fifty-eight of these patients had acute conditions, including 39 with herniated disks, 11 with muscular or ligamentous strains, 3 with torticollis, and 5 with contusions, multiple fractures, and muscle soreness due to accidents. There were 12 patients with chronic conditions. Seven of these had arthritis, myositis, and fibrositis, while five had night cramps.

In a postoperative group of 18 cases, methocarbamol was administered to relieve voluntary muscle overactivity. The remaining 12 cases included dislocations of the shoulder, spastic flatfoot, tetanus, and low back pain due to tension. In 2 out of the 100 patients studied a significant amount of dizziness and nausea occurred, and in these the drug was discontinued before any improvement could be noted.

The patients ranged in age from 12 to 78 years, with an average age of 40. Since the drug was so well tolerated and there appeared to be no contraindication to its use in children, I feel that further study in patients under 12 years of age is indicated. This is contemplated in the near future, based upon the encouraging results obtained by another investigator.[3]

Criteria for Evaluation

Five of my associates and I appraised the patient's response, making every effort to be as objective as possible. The results of necessity depended upon the clinical judgment of this group, as they must in any other study of this type, with the exception of those cases where objective measurements could be made. My experience with similar groups of cases judged in the same way, but treated with other muscle relaxants or physical therapy and conservative methods, served as a basis of comparison.

Method of Administration

The average oral dose of methocarbamol was 6.0 Gm. per day in divided doses, using 500-mg. compressed, scored tablets. An intravenous preparation containing 2.5% of methocarbamol in saline solution was also used. The dose was usually 500 to 625 mg. three to four times a day, and this was injected over a period of approximately one to two minutes. On occasion, 1 Gm. of methocarbamol in saline solution was placed in a flask of 5% dextrose solution as an intravenous drip over a period of three to four hours, after an initial intravenous injection of 500 mg.

It is undoubtedly true that larger doses could have been used in both oral and intravenous administration, because the incidence of side-effects was so low and these reactions were so mild. As much as 6 Gm. of the drug have been injected as rapidly as possible in a patient under anesthesia with no toxic effects and no depression of respiration.[4]

Response to Therapy

The benefit obtained by the use of the drug was judged to be pronounced when the patients became much more comfortable and their muscle spasm disappeared. When a demonstrable satisfactory effect was obtained by drug administration, but less than in the first category, with incomplete relief of pain and muscle spasm, the results were graded as moderate. When no response was obtained the results were judged as none.

Acute Cases—58 Patients.—In 39 patients with herniated lumbar and cervical disks, who received methocarbamol for relief of pain and muscle spasm, the response was judged to be pronounced in 25. In most instances the attacks subsided quickly, so that the patients could continue to work or go back to work sooner than expected.

CASE 1.—The diagnosis in this 43-year-old male was herniated cervical disk at C-6 on the right. He had had recurrent episodes of pain and stiffness of the neck for four to six months. The present episode of one week's duration consisted of pain in the neck and pain and numbness, with some weakness, in the right arm. There was marked limitation of motion of the neck and a persistent torticollis. An absent right triceps reflex and atrophy of the right triceps muscle were noted.

The patient was started on therapy with 1 Gm. of methocarbamol every four hours and the dosage was increased to 1.5 Gm. every four hours after the first three days. He received physiotherapy and was unable to tolerate head halter traction. He left the hospital after four days and continued the medication at home for a week. He was very much improved on his return visit. He then continued the drug for 10 additional days and returned with a full range of motion and no pain, although he still had the motor weakness and absent right triceps reflex.

The patient had an acute recurrence two weeks later, but this was again relieved with methocarbamol in about two days; he has had no further difficulty.

In 13 patients with herniated disks a moderate response was obtained. There was no response to drug therapy in one patient of this group, who received only 2 Gm. of methocarbamol daily. This is now considered an ineffective dose for most people.

In patients with herniated disks the painful episodes and muscle spasm subsided in 33 patients, 4 required surgery, one went elsewhere for treatment when surgery was advised, and one patient was still having difficulty when last seen.

CASE 2.—This 55-year-old male with a recurrent herniated lumbar disk was first started on methocarbamol therapy on Aug. 28, 1956. He received 4 to 6 Gm. daily for a period of two weeks. Treatment also included bed rest and a back brace. There was some improvement in relief of pain and muscle spasm during the first week; however, after two weeks the patient was completely free of symptoms. There were no side-effects, and it is interesting to note that the patient had a peptic ulcer and was intolerant to aspirin, codeine, or meperidine (Demerol) hydrochloride. Methocarbamol, however, was well tolerated.

In 11 patients with acute muscular or ligamentous strains, including three cases of severe whiplash injuries of the cervical spine, a pronounced response was obtained in 6 and a moderate response in 5 patients. In three cases classified as acute torticollis, a significant degree of relief of pain and spasm and return of motion occurred in less than 24 hours.

Methocarbamol was given intravenously to one of these patients, and the response was observed in less than five minutes. The drug was given in five accident cases for relief of pain due to muscle spasm and generalized "soreness." The response was judged to be pronounced in three and moderate in two.

Chronic Conditions.—In the seven patients with chronic arthritis, myositis, and fibrositis, the response was pronounced in four and moderate in three. In five patients with night cramps in their legs or abductor muscle from hip difficulties, three obtained a pronounced response and two a moderate result.

Postoperative Group.—Eighteen patients received methocarbamol during their immediate postoperative period. In eight the response was judged to be pronounced because relief of pain and spasm was quite dramatic. They were able to move about better in bed, became ambulatory sooner, and required much less narcotic after they were started on methocarbamol therapy. The results in 10 patients were judged as moderate, because the drug was thought to be helpful but the response was less dramatic.

CASE 3.—The diagnosis in this 54-year-old male was old nonunion fracture of the neck of the femur with aseptic necrosis. On Jan. 11, 1957, a replacement arthroplasty was performed with insertion of an F. R. Thompson femoral-head prosthesis. An adductor tenotomy was also done. Postoperatively, he had a great deal of pain and muscle spasm due to long-standing contractures and shortening of the muscles about the right hip. He complained bitterly of pain and was unable to help himself or move about in bed.

On the second postoperative day the patient was started on therapy with 1 Gm. of methocarbamol by mouth every four hours during the day and as needed at night. Within 24 hours the patient was much more comfortable and was moving himself about in bed. He was out of bed within two days after starting therapy, and getting about on crutches and starting active exercise of his hip. He required no narcotics 24 hours after the institution of the oral medication with methocarbamol.

Miscellaneous Conditions.—In three patients in this group with anterior dislocation of the shoulder, methocarbamol was given intravenously along with the usual dose of meperidine. All three obtained sufficient muscle relaxation to allow an easy reduction of the shoulder without anesthesia.

CASE 4.—This 20-year-old male had recurrent dislocation of the shoulder. There were three previous dislocations of this shoulder and the present one occurred 45 minutes before he was seen, when he reached backward to close a car door. He stated that his shoulder had always been very difficult to reduce and that no physician had ever been able to do it by pulling his arm or manipulating and that he required anesthesia. He was given 100 mg. of meperidine intramuscularly 30 minutes before and 50 mg. of meperidine intravenously just previous to the intended manipulation. He withstood the pain of the manipulation very well but was unable to relax his muscles enough to permit the shoulder to be reduced, in spite of the fact that several different maneuvers and positions were tried.

He was then given 20 cc., or 500 mg. of methocarbamol intravenously and in less than one minute there was some twitching of his muscles and they visibly relaxed. Then, with a minimum of traction and no pain, the shoulder was slipped into place without difficulty. The patient was able to sit up immediately and the Velpeau bandage was applied to his shoulder. Except for the drowsiness and dizziness attributable to the large dose of meperidine he had no visible reaction.

This is an excellent example of a procedure for which success depends upon good muscle relaxation and for which the intravenously administered form of methocarbamol worked very well.

The intravenous administration of methocarbamol in one patient with spastic flatfoot enabled manipulation without anesthesia. There was one case of tetanus with generalized severe tetanic muscle contractions. This condition was safely and easily controlled by methocarbamol given intravenously at first and later by stomach tube. (This case is to be reported in detail in a separate paper.)

The results in five patients with low back pain due primarily to anxiety and tension states were judged to be moderate in two and none in three. All results are tabulated in table 1.

Side-effects

No serious reactions to this drug and very few unpleasant side-effects have been observed. Tabulation of side-effects is contained in table 1. Four patients complained of lightheadedness, but this usually was improved as drug therapy was either continued or the dose lowered. There was nausea in three cases but not vomiting or diarrhea. Meperidine was administered in two of these patients who received methocarbamol intravenously for reduction of anterior dislocation of the shoulder. Since it could not be determined whether this was entirely due to meperidine or in part to methocarbamol, these were considered as possible side-reactions to the latter drug. In the third patient, the drug was discontinued before an effect could be observed because of this complaint.

Headache was reported by one patient, and one patient after operation apparently ran a fever, with temperature of 102 to 103 F (38.9 to 39.4 C) from this drug. At least, the temperature came down to normal after the drug was discontinued.

Table 1.—*Response of 100 Orthopedic Patients to Methocarbamol Therapy*

Selection of Cases	No. of Patients	Response: Pronounced	Response: Moderate	Response: None	Side-effects	No.
Acute 38						
Herniated disks (lumbar and cervical) ...	39	25	13	1	Slight lightheadedness	1
					Slight light headedness†	1
Ligamentous strains..	8	4	4		Headache†	1
Whiplash injuries	3	2	1			
Torticollis	3	3				
Accident	5	3	2			
Chronic 12						
Arthritis, myositis, fibrositis	7	4	3			
Night cramps	5	3	2			
Postoperative 18	18	8	10		Possible fever dizziness†	1
Miscellaneous 10						
Anterior dislocation of shoulder	3*	3			Dizziness, nausea‡	1
					Light headedness	1
					Dizziness nausea‡	1
Spastic flatfoot	1	1				
Tetanus	1	1				
Low back pain associated with anxiety	5		2	3		
Dropped from study ...	2			2	Nausea	1
					Light headedness	1
	100	57	37	6		

* Methocarbamol given intravenously.
† Disappeared on reduction of dose.
‡ Meperidine also given.

There were no skin reactions, joint reactions, or hemolytic disturbances or jaundice in this group of 100 cases. Subsequent use of the drug has resulted in two cases of allergic-type skin reaction, in my experience. Several patients reported mild drowsiness and for that reason one or two were unable to take the medicament and continue working.

In summary, then, side-effects were elicited in 10 out of 100 patients. In two patients the simultaneous administration of meperidine may have been the cause of the patient's symptoms. Drowsiness and lightheadedness disappeared after slight reduction of the dose in three patients, so that they were still afforded benefit from the medication. The reactions and side-effects were strikingly less than with other drugs previously used for the same purposes, but they should be watched for carefully with methocarbamol, just as with any other new drug.

Comment

In evaluating the effect of this drug, one must keep in mind the purpose for which it was given. It is known to have its main effect on multisynaptic reflexes within the spinal cord, and was used in this series of cases primarily to relax spastic voluntary muscle and relieve the discomfort associated with it. Many of the cases are of a mechanical type disorder and must be relieved by mechanical means. It is inane to think of a tablet or injectable solution actually reducing a dislocated shoulder or pushing a herniated disk back into place; but if the drug produces muscle relaxation, sufficient to allow the shoulder or disk to be reduced more easily, then it has fulfilled the purpose for which it was given. In fact, if the disk is completely ruptured so it cannot go back into place and must be removed, the action of the drug should still be considered a success if it has produced temporary relief of muscle spasm and discomfort under such circumstances.

Investigators in the field of "pain mechanisms" often advance the theory that the multisynaptic reflexes in the spinal cord are responsible for the augmentation and perpetuation of painful stimuli. It would seem that methocarbamol might be quite effective in producing the physiological block that is often necessary to interrupt this self-perpetuating mechanism and relieve such a reflex dystrophy. In fact, that may have been its *modus operandi* in some of these cases in which the clinical diagnosis was not as definite as the relief that was obtained.

There was no selection of the cases to be included in this series. It contains all that could be located, on which there was an adequate follow-up. The pertinent information on 24 representative cases has been extracted for presentation in table 2. In order to give the reader a clear concept of the response he might expect to see in several types of patients studied, four cases were presented in greater detail.

Summary

In a clinical study, 100 orthopedic patients with painful muscle spasm were evaluated from the standpoint of their response to the administration of methocarbamol (Robaxin). The results after administration of methocarbamol were as follows: A significant response was noted in 94% of these cases (57% pronounced, 37% moderate, 6% none). Minor side-effects noted in 10% of the patients disappeared in three on reduction of dosage.

Orally given methocarbamol was used effectively for relief of the severe pain and muscle spasm of acute torticollis and herniated inter vertebral disks

TABLE 2 —*Data on Representative Cases*

Age	Sex	Date	Diagnosis and Findings	Dosage Schedule (Gm) and Treatment	Side-effects	Response
29	M	8/25/56	Acute herniated disk lumbar severe pain, spasm and limited motion	6-9 per day, orally for 2 wk ; bed rest and brace	None	Good relief of pain and muscle spasm in 24 hr herniated disk subsided in 2 wk.
34	M	8/29/56	Postoperative lumbar ruptured disk "cramps" in both legs at night	1 at bedtime and repeated in 4 hr if awakened	None	Good relief of "cramps"
33	F	8/30 56	Herniated cervical disk pain and numbness in neck and right arm, muscle spasm and limited motion in neck	6 per day orally for 1 wk ; traction and cervical collar	None	Good relief of pain and muscle spasm in 3 or 4 days returned to work in 1 wk patient very enthusiastic about drug which gave her more relief than mephenesin or meprobamate
29	F	9/15/56	Old slipped capital femoral epiphysis post operative replacement—arthroplasty with femoral head prosthesis adductor muscle spasm and leg cramps at night	3 to 4 per day, orally, for 2 wk	None on 0 5 Gm every 4 hr some dizziness and lightheadedness on 1 Gm	Marked relief of night cramp and adductor muscle spasm
34	M	10/11/56	Recurrent cervical dorsal myositis and fibrositis previous temporary relief from procaine injection at trigger points	6 per day, orally, for 4 days	None	Attack subsided in 2 days patient very enthusiastic
44	F	9/1/56	3 yr postoperative femoral head prosthesis for comminuted fracture of head of femur moderate pain and spasm about hip	6 per day, orally for 3 wk then off 10 days and back on for 10 days followed by adductor tenotomy and tensor fascia lata release	None	Fair relief of spasm and pain; she first thought it didn t help but was worse when not receiving it so therapy was started again
60	M	10/12/56	Thoracic spondylosis with early osteophyte formation fatigue and pain in thoracic spine with standing or leaning forward pain in early morning	4 to 6 per day orally, for 1 wk , and then as needed	None	Excellent relief in 3 to 4 days
28	F	1/2/57	Probable old tear or strain of ligamentum nuchae at C 7 spinous process pain and tenderness at spine of C 7 for 6 mo since mild flexion injury x rays negative including flexion and extension views	4 to 6 per day orally, for 10 days	None	Practically complete relief of pain and tenderness when seen after 2 wks
66	F	11/20 56	4 mo postoperative femoral head prosthesis for subcapital fracture of right hip she did well at first but gradually developed sudden severe, catching pains and spasm about her hip x rays negatives had to stop walking	0 5 every 4 hr for about 3 wk	None	Comfortable since third day on medication no pain or spasm getting about well on walker again
64	M	2/6 57	2 days postoperative subtrochanteric osteotomy left hip severe pain and muscle spasm unable to rest or be moved in bed without severe pain	4 per day for 11 days orally, starting on second postoperative day	None	Pain and spasm were relieved to a large degree within a few hours and he required no more narcotics after that night
45	M	1/21 57	Acute torticollis underlying cervical arthritis and possible herniated disk severe spasm and limited motion	0.5 intravenously and then 4 per day orally for 5 days	None	Marked relief of pain and spasm and increased motion in neck within 5 min
30	M	8/15/57	Acute torticollis with severe muscle spasm no injury no neurological changes	6 per day orally, for 3 to 4 days	None	Complete relief the 1st day so stopped drug and torticollis returned took drug 3 days and obtained complete relief
41	M	1/15/57	Postoperative arthrotomy right knee for torn meniscus and loose body severe pain and spasm	4 per day orally, for 6 days starting day after operation	None	Good relief of pain and muscle spasm in 24 hr stopped narcotics on second day
40	M	2/15/57	3 days postoperative bone graft to humerus for nonunion pain and muscle spasm	6 per day, orally for 9 days	None	Noticeable relief of pain and muscle spasm
46	F	6 8 57	Whiplash injury of cervical spine x rays negative pain in neck and occipital headache	4 to 6 per day, orally, for 1 mo ; cervical collar	None	Methocarbamol controlled her pain and spasm very well during first month almost complete recovery in 2 mo
37	F	5/16/57	Myositis and fibrositis pain at base of neck upper dorsal region, and both shoulder girdles worse late in the day early part of the night or in bad weather	1 every 4 hr or just at bedtime, as needed	None	Helped with pain and soreness so she could relax and go to sleep at night
25	M	5/31/57	One day postoperative laminectomy for herniated lumbar disk methocarbamol given for pain and spasm	6 per day, orally, for 1 wk	None	Much more comfortable as soon as the drug was started got up on the 3rd day went home in 1 wk
53	F	1/20/57	Bilateral Colles fractures and compression fractures of spine generalized muscle soreness and stiffness	4 per day orally for 10 days started 3 days after accident	None	More comfortable helped relieve her stiffness and sore muscles
32	M	1/3/57	Acute low back pain possible herniated lumbar disk tenderness and spasm in lumbar muscles	6 per day for 5 days	None	Attack subsided in about 4 days
30	F	12 29 56	Auto accident with severe contusion of shoulder and costochondral separations severe pain and spasm with movement and respiration	6 per day for 10 days application of rib splint	None	Prompt relief of pain in ribs and shoulder
43	F	3/18 57	Severe whiplash injury of cervical spine x rays negative neurological negative headache and pain in cervical and upper thoracic spine	Started on day of injury -6 per day orally, for 10 days then 1 every 4 hr as needed	None	Unusually rapid recovery from a severe whiplash injury neck gave very little pain after 10 days and headache was better, incidentally reported she had no menstrual cramps for first time in years
43	M	5/21/57	Acute low back strain and contusion	6 per day, orally for 1 wk , rest and heat	None	Drug seemed to help him get over soreness and he returned to work
45	M	1/10/57	Old thoracolumbar scoliosis chronic muscle and ligamentous strain, with pain for past 6 mo	4 to 6 per day, orally, for 1 wk , then as needed	None	Pain relieved within a week and no recurrence when seen 4 mo later
42	F	8/5/57	3 days postoperative laminectomy for spondylolisthesis, severe pain and spasm	5 per day orally, for 2 wk	None	Moderate relief of pain and spasm

and in postoperative cases to combat painful muscle spasm. In fracture and accident cases the drug relieved spasm and muscle soreness and enabled these patients to move about and become ambulatory sooner, generally with less use of narcotics.

Its effectiveness in more chronic cases, such as spondylitis, myositis, and fibrositis, was gratifying; relief of nighttime leg cramps was noted in several patients.

Intravenously given methocarbamol is a safe and very effective muscle relaxant. It has proved beneficial in the reduction of dislocated shoulders without anesthesia and in the manipulation of a spastic flatfoot.

The methocarbamol used in this study was supplied as Robaxin by the Department of Clinical Research, A. H. Robins Company, Inc., Richmond, Va.

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CLINICAL RESULTS WITH METHOCARBAMOL, A NEW INTERNEURONAL BLOCKING AGENT

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Methocarbamol was administered to approximately 110 patients with various forms of neuromuscular disease marked by involuntary muscular activity. Given intravenously, the drug caused significant reduction of both involuntary tonic and clonic contractions in 30 patients whose symptoms were ascribed to lesions of the pyramidal tracts or to acute myalgic disorders. If relief was obtained, it appeared within 30 to 45 minutes. The results were sufficiently striking to warrant more thorough investigation.

In all fields of medicine concerned with the management of long-term disabling conditions, perhaps the most trying disorders to control are those related to involuntary increase in muscle tone. From the viewpoint of a physiatrist closely affiliated with rehabilitation center activities, the disorders involving pyramidal tract function are only temporarily ameliorated by physical treatment. Through bracing, strengthening of residual function, regaining available range of motion, and training in substitute methods, it is stimulating to see what can be accomplished with individual patients. In selected cases surgical procedures of many types may be advantageous. Joint stabilization, selected neurectomies, alteration of tendinous arrangement about moving parts, and changing muscle function from polyarticular to monoarticular action may be done to attain better function. However, whether medical and/or surgical procedures are undertaken, the basic problem of spasticity remains unabated. Therefore, the search for effective methods to control spasticity and muscle spasm continues. This is a report of observations made on a clinical screening trial of a new interneuronal blocking agent, methocarbamol (Robaxin).

Pharmacology of Methocarbamol

Guaiacol glyceryl ether, a short-acting skeletal muscle relaxant,[1] is the parent compound from which methocarbamol is derived. Chemically, methocarbamol is 3-(o-methoxyphenoxy)-2-hydroxy propyl-1-carbamate. Truitt[2] performed the pharmacodynamic studies with methocarbamol and suggested that the prolonged relaxing effect on voluntary muscle produced by this compound indicated its clinical use. In these studies he demonstrated that methocarbamol acts at the level of the spinal cord, through a depression of the multisynaptic pathways, with no effect on the monosynaptic reflexes. It was demonstrated by Solomon,[3] in studies on isolated nerve muscle preparation and rats with the cervical cord transected, that methocarbamol had no activity upon the motor nerves, muscles, myoneural junction, or monosynaptic arcs. The protective action of this compound against

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pentylenetetrazol and electroshock convulsions and a prolongation of the hexobarbital sodium–induced sleeping time in mice[4] suggested a supraspinal locus of action for this compound. Thus, the marked and prolonged skeletal muscle relaxing properties and wide range of safety with methocarbamol recommended its application clinically in disease states manifesting skeletal muscle hyperactivity.

Case Selection and Method of Study

From Jan. 2 to Oct. 11, 1957, approximately 150 patients with involuntary increase in muscle tone were treated with methocarbamol by the department of physical medicine and rehabilitation. Of the entire group, there were 42 patients, with a variety of conditions, in whom the signs and symptoms were stabilized. The addition of the medication was the only change in the treatment program. These patients were selected for close observation of the clinical effect of methocarbamol.

In all patients included in this study a complete examination was done prior to starting the medication. Strength, range of motion, intensity of simple and complex reflexes, abnormality of motion, pain, degree of muscle spasm, and other related findings were assessed clinically and recorded. Periodic follow-up examinations were done after medication was started and after medication was discontinued. The therapeutic effect of methocarbamol was graded in three categories: (1) significant measurable response on gross physical examination, (2) questionable response, and (3) no significant response.

The range in ages of the study group was 4 to 72 years with 27 persons in the 25 to 55 year range. Four patients were treated at institutions other than the Medical College of Virginia Hospitals, for demonstration purposes. In two of these demonstration cases the patients were treated only one day with medication given intravenously. Ten patients were observed during admission to the Medical College of Virginia Hospitals. The remaining 28 were followed on an outpatient basis. Motion picture recordings were made in three instances.

Clinical Response to Methocarbamol in Various Types of Disorders

Disease Category	Cases, No.	Duration of Treatment, days	Total Dose per Day, Gm.	Medicament Used Intravenously	Clinical Response			Side-effects	
					Significant	Questionable	None	Patients, No.	Symptoms
Spinal cord injury with residual spasticity	11	14-135	8 -10	3	10	0	1	2	Transient "fuzzy" vision (with intravenous medication) in 1; drowsiness in 1
Encephalomyelopathy with residual spasticity	4	1-120	0.5- 8	2	4	0	0	0	...
Cerebrovascular accident with residual spastic hemiplegia	5	3- 60	5 - 8	0	5	0	0	2	Dizziness in 1; headache in 1; drowsiness in 2
Multiple sclerosis (chronic)	2	14- 30	3 - 8	1	2	0	0	2	Drowsiness in 1; easy fatigability in 2; increasing unsteadiness of gait in 2
Acute myalgia (idiopathic)	3	7- 14	8	3	3	0	0	1	Transient nausea (with intravenous medication)
Cerebral palsy, spastic paraplegic type	5	30-120	4 - 8	0	3	2	0	0	...
Cerebral palsy, rotary athetoid type	2	14- 30	6 - 8	0	0	0	2	1	Drowsiness
Chronic arthritic and myalgic disorders with pain and muscle spasm	10	3- 30	4 - 8	0	0	0	10	1	Dull headache; inability to concentrate

Results

The therapeutic effect of methocarbamol and the untoward side-effects are summarized in the table.

Spinal Cord Injury with Residual Spasticity.—In the group of patients with spinal cord injury and residual spasticity were three persons with demonstrated complete traumatic transection of the cord. The remainder had partial lesions. The level of cord injury ranged from the fifth cervical vertebra to the sacral cord area. All had overt evidence of spasticity. The end-results of treatment differed in the completely and partially involved groups. Characteristic examples are as follows:

CASE 1.—A 28-year-old man, in November, 1956, was in a noncollision automobile accident and sustained a fracture-dislocation at the level of the fifth and sixth cervical vertebrae. Decompression operation was done within 48 hours of injury because of complete spinal fluid block. At operation the patient was found to have extensive maceration of the spinal cord at the level of bony injury.

Repeat examination on March 9, 1957, revealed spastic quadriplegia consistent with complete cord damage at the level of the fifth and sixth cervical vertebrae. The patient had frequent forceful involuntary movements of the lower extremities and trunk. This interfered with sleep, and siderails had to be placed on the bed to prevent his falling out. All tendon jerks were very brisk. He had sustained ankle, knee, and wrist clonus. The shoulder joints were very tight and painful. The elbows could not be extended beyond 90 degrees because of spasm in the biceps. The heel cords were very tight. The patient was started on therapy with methocarbamol, 2.0 Gm. given orally four times daily, on March 9, 1957. On the first night he slept better than usual, and on the second night he slept the entire night without being awakened by involuntary movement.

On March 14, involuntary movement could be demonstrated only with intense stimuli (i. e., shaking the bed or forceful testing for the Babinski response). The wrist and ankle clonus were reduced to three or four sluggish repetitions, and the elbow joints could be stretched to within 15 degrees of full extension. The isolated tendon jerks remained very brisk.

The physical findings on April 10 were the same as reported on March 14. The medication was discontinued because the supply ran out. It was decided to observe the effect.

Reexamination on April 16 revealed essentially the same findings as observed on March 9. Methocarbamol therapy was resumed on April 21 with good relief of spasticity within 48 hours. The effect continued until the patient's discharge to another hospital on May 15. No side-effects were observed.

Case 2.—A 44-year-old man was admitted to the hospital in September, 1956, with a history of insidious loss of voluntary control of the right lower extremity for two years and mild weakness in the left calf for six months. Exploratory operation done on admission revealed hemangioma of the low lumbar and sacral area of the spinal cord. Coagulation and resection were done.

After the operation the patient had total loss of voluntary function in the pelvic girdle and lower extremities and bladder and bowel incontinence. About two weeks after the operation he began developing signs of spasticity, and by the eighth week the spasticity was severe. About the eighth week early voluntary hip flexion and knee extension could be identified. The patient was fitted with drop foot braces, and he became ambulatory with corset, braces, and crutches.

The principal problems observed on Feb. 2, 1957, were (1) severe tightness in heel cords (1-in. heel lifts were needed); (2) continual severe sustained ankle clonus with weight bearing; (3) weakness in gluteal muscles, bilaterally; and (4) inability to walk without braces. When the patient was in a standing position without braces, the ankles assumed a marked talipes equinovarus position. The patient was given 1 Gm. of methocarbamol intravenously over a 12-minute period. About five minutes after the medication was started, he developed "fuzziness of vision" which cleared completely before the full dose was given.

Within 30 minutes after administration of the medication, the sustained clonus was converted to unsustained clonus with only three to four repetitions. The patient was unable to walk in stocking feet with crutches. The ankle and knee jerks continued to be very brisk. He was started on therapy with methocarbamol, 2 Gm. given orally four times daily.

On reevaluation on Feb. 22, the patient could walk rapidly with crutches and brace, without clonus being evident in the gait. The left ankle could be dorsiflexed past neutral position by 10 degrees and the right ankle to neutral position. There was an unsustained clonus with five to seven repetitions.

Reexamination on March 23 revealed further improvement in passive range of ankle motion; otherwise there was no change. All medication was discontinued.

On April 16 it was found that the patient had retained his improved functional level after use of methocarbamol was discontinued. A report by letter in July, 1957, indicated that there was no return of clonus with weight bearing. The transient visual symptom was the only side-effect noted.

All patients with complete cord lesions had return of severe spasticity and complex involuntary movement when the medication was discontinued. The patients with partial damage retained improved functional ability and suppression of mass reflex patterns after use of methocarbamol was terminated.

Encephalomyelopathy with Residual Spasticity.—In the group of patients with encephalomyelopathy with residual spasticity were two patients with tuberculous meningitis, one with influenzal meningitis, and one with residual spasticity after prolonged cardiac arrest. All patients had original onset of the primary disease more than 12 months prior to the study, and disorders had cleared, by clinical standards. All had severe generalized spasticity. An example of the observations in this type of case follows:

Case 3.—A 27-year-old man (demonstration case) was admitted to the hospital in September, 1955, in coma and with high fever and severe generalized muscular weakness. Examination of the spinal fluid revealed the presence of acid-fast organisms on culture. The primary disease was brought under control in four months, but the patient continued to have severe residual spasticity. When examined on Aug. 15, 1957, he had very brisk tendon jerks and sustained ankle and knee clonus. With crutches and braces he was able to walk 15 to 20 feet. The gait was awkward and stiff. He could not walk without braces because of talipes equinovarus of ankles and sustained clonus.

The patient was given 0.5 Gm. of methocarbamol intravenously over a 10-minute period. Within 20 minutes after termination of medication, the clonus was converted to unsustained level. The patient walked in stocking feet with crutches for 25 feet without fatigue. With the braces, the gait was much smoother and he walked for about 100 feet without fatigue.

No oral medication was started. When seen on Sept. 19, 1957, the patient had retained ability to walk for long distances without fatigue, but he could not walk without braces.

Cerebrovascular Accident with Residual Spastic Hemiplegia.—The patients with hemiplegia had paralysis for longer than nine months. With medication, all demonstrated clear reduction in degree of spasticity on the involved side. As in the patients with partial paraplegia, improved function was retained after the medication was discontinued.

Multiple Sclerosis.—Both of the patients who had multiple sclerosis had endured the disease for longer than 10 years. The defect in gait had been unchanged for more than one year. The medication caused suppression of mass reflex activity, but because of increasing unsteadiness in gait the medication was discontinued. No change was observed in the actual muscle strength in either case.

Acute Myalgia.—In the group of patients with acute myalgia, there were two with severe pain and muscle spasm in the lumbar region and with inability to stand erect (one case of two days' and the other of eight days' duration). One patient had acute torticollis for 48 hours. Trauma was not associated with onset, and there was no neurological deficit. All patients were given medication intravenously, with doses ranging from 0.5 to 1.0 Gm. Orally given medication was instituted three hours later, at 2 Gm. four times daily. No objective change was noted immediately after the intravenously given medication, although each patient reported subjective improvement. Recovery of nearly full range of motion was observed in 12 to 18 hours, and all muscle spasm cleared in three to seven days.

Cerebral Palsy.—Seven patients with well-defined types of cerebral palsy were chosen for observation. In three patients with spasticity, it was clearly evident that over-all muscle tone was significantly lessened, i. e., the knee joint of the brace could be locked with reasonable ease, where for years it had been a difficult process. The mass reflexes were decreased. No objective change was noted in the patient with athetosis.

Chronic Arthritic and Myalgic Disorders with Pain and Muscle Spasm.—The group of patients with chronic arthritic and myalgic disorders with pain and muscle spasm included one with severe active rheumatoid arthritis, two with degenerative arthritis, four with chronic fibromyositis (for longer than 12 months), and three with residual weakness following poliomyelitis who were subject to recurrent skeletal muscle cramps.

The patient with rheumatoid arthritis had been known in the arthritis clinic for more than two years. During that time he had had a constant high degree of disease activity. He was admitted to the hospital. For two weeks physical therapy and medication for arthritis were kept at a constant level. Activity of the disease remained stable. During the two-week period in which methocarbamol was added to the treatment program, no change was observed.

Both of the patients with degenerative arthritis were elderly females with characteristic findings of this disorder. One had involvement of the knees and the other of one hip. They were taking no medicament when first examined. No spontaneous relief of symptoms or increase in motion was noted during the period of methocarbamol therapy. Salicylates and physical therapy afforded relief during the ensuing treatment period. No objective changes were noted in the patients with chronic painful fibromyositis or in the patients with recurrent muscular cramps following poliomyelitis.

Side-Effects

No irreversible side-effects or toxic effects have been noted in the 150 patients treated with methocarbamol. In two cases the medication was discontinued because of undesirable side-effects. One patient with hemiplegia and mild aphasia developed dizziness and drowsiness within 15 minutes after 1.5 Gm. of methocarbamol had been given. This persisted for three days at a very aggravating level, and medication was discontinued. About three months later the patient was started on graduated doses without any side-effects. The other patient had recurrent muscular cramps following bulbospinal poliomyelitis. He worked as a time and payroll clerk. About 30 minutes after taking 1.5 Gm. of methocarbamol, he found it difficult to add the payroll. He also complained of a "hangover" type of dull headache. The medication was discontinued in three days.

Two patients noted side-effects when given medication intravenously. One patient had transient "fuzzy" vision. This cleared before the full dose had been given. The other patient had transient nausea, which cleared spontaneously in about 30 minutes after administration of methocarbamol.

In both patients with multiple sclerosis, use of the drug was ultimately discontinued because of the easy fatigability and observable evidence of increasing unsteadiness in gait. The medication appeared to have a laudable objective neurological effect without impairment in strength. Because of the subjective complaints, it was thought advisable to stop the medication.

In all other patients the side-effects were relieved by slight reduction of the dosage. No side-effects developed after 72 hours on the medication.

Comment

All patients who had a demonstrable significant response to the medication attained the effect within 30 to 45 minutes after intravenous induction or within 72 hours on oral medication. In no instance was there any significant reduction in voluntary strength or intensity of simple reflexes. For the period of this study, no patient developed an attenuating effect to the medication.

Of the 27 patients with residual spasticity following disorders involving the pyramidal tracts, only three failed to show significant clinical response on gross physical examination. The characteristic result was suppression of complex reflex activity and bizarre involuntary movement. In no instance was there decrease in intensity of simple reflex responses or voluntary muscular strength. No objective response to treatment was noted in patients with muscle spasm resulting from joint disease, primary disease of muscle, extrapyramidal conditions, or anterior-horn-cell disorders. This appears to confirm the findings of Truitt and Solomon that methocarbamol acts to suppress multisynaptic neuronal pathways and has no significant activity on the motor nerves, muscles, myoneural junction, or monosynaptic arcs.

It is particularly interesting that a salutary effect of this drug was observed in patients with acute low back pain and acute torticollis. It is generally considered that these disorders are the result of strain or tear in ligamentous or muscular structures. Since methocarbamol appears to have no activity on primary reflex muscle spasm, is it not reasonable to assume that idiopathic myalgia is the result of an increase in the excitatory state at the internuncial pool level?

The side-effects reported in the table are not considered to be toxic effects of this drug. Instead, the symptoms, such as drowsiness, difficulty in concentration, and "fuzzy" vision, suggest that methocarbamol has a secondary supraspinal focus of action.[2] These central effects did not interfere with the use of the drug.

Summary and Conclusions

Methocarbamol (Robaxin) was evaluated in 42 patients with a variety of disorders manifesting an increase in involuntary muscle tone. In 30 patients with pyramidal tract and acute myalgic disorders, use of this drug resulted in a significant improvement in 27 (90%), questionable improvement in 2, and none in 1. There was no change in 12 patients with chronic arthritic, extrapyramidal, and myalgic disorders, as a result of drug administration. In all but two patients the side-effects were reversed on slight reduction of dosage. No side-effects developed after 72 hours on the medication. Methocarbamol has a sufficiently prolonged action so that the functional capabilities of patients with pyramidal tract disease have been significantly improved. The results of these trials warrant further study of this type of medication.

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The methocarbamol used in this study was furnished as Robaxin through Jack Freund, M.D., Associate Director of Clinical Research, A. H. Robins Company, Inc., Richmond, Va.

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RELIABILITY OF TUBELESS GASTRIC ANALYSIS IN PRESENCE OF COMPLICATING DISEASES

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Two methods for detecting gastric achlorhydria, the conventional and the tubeless methods, were compared in a study of 114 hospital patients. Each patient had a disease that might be expected to interfere with the physiological mechanisms involved in the tubeless method. The fasting patients received 1.0 mg. of histamine phosphate subcutaneously to stimulate gastric secretion. After 45 minutes a urine specimen was obtained and a sample of gastric juice was removed for the conventional titration with dimethylaminoazobenzene (Töpfer's reagent) as indicator. The patient then received 2 Gm. of a cation exchange resin (containing 90 mg. of azure A) with 240 ml. of water. Two hours later a second urine specimen was obtained for comparison with the first. Appearance of the dye in the second urine specimen, indicating the presence of free acid in the stomach, was correlated with the amount of acid disclosed by titration. Discrepancies between the results of the tube and the tubeless methods were found in 12 patients, 7 of whom had renal disease. In 102 patients the results of the two tests agreed. The simplicity of the tubeless method recommends it for use as an office procedure and in screening large numbers of patients.

The desirability of a technique for determining gastric acidity without intubation has long been recognized by physicians and patients. In 1950 Segal[1] described a procedure using a cation exchange resin in which the hydrogen ions had been replaced with a quinine compound. At pH 3.8 or lower the quinine was released, absorbed from the small intestine, and excreted by the kidneys. Its presence in the urine could be detected by its characteristic fluorescence. In the absence of free gastric acid no quinine was liberated from the resin compound in the stomach. Several workers confirmed Segal's findings of close agreement with intubation techniques.[2] The procedure, however, did not receive wide acceptance for two reasons: 1. Care was needed to prevent the ingestion, for several days before the test, of vitamins and other medicaments whose excretory products were fluorescent. 2. The technique of quinine extraction was time consuming and tedious.

In 1953, Segal, Miller, and Plumb[3] modified the procedure by substituting the thionine dye, azure A, for the quinine in the cation exchange resin. The dye could be detected in the urine by its blue color. Medicaments did not interfere, and no time-consuming extraction process was necessary. In vitro tests showed that release of azure A began at pH 3.2 and was maximal at pH 1.5. Close agree-

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ment with gastric acidity determinations by the intubation and quinine resin techniques was demonstrated.[4]

The chief limitation of tubeless gastric analysis is its lack of quantitative value. In the absence of free gastric acid, azure A is not excreted in the urine in a significant quantity within the test period. In the presence of free acid, the quantity of dye excreted does not correlate with the amount of acid measured by the standard titration technique. When quantitative data are desired, intubation is necessary.

The tubeless gastric analysis will probably find its place in clinical medicine as a screening device for the detection of gastric achlorhydria. The early detection of gastric malignancy is oriented to the careful surveillance of patients with premalignant lesions. Gastric achlorhydria is the most commonly recognized entity in which there is an increased incidence of gastric malignancy.[5] The careful scrutiny of asymptomatic achlorhydric individuals has been reported to yield an incidence of 1% gastric carcinoma.[6] Because of its simplicity and low incidence of false-negative results, tubeless gastric analysis is well suited for screening purposes.

Little is known of the fate of azure A following its absorption from the gastrointestinal tract. The literature stresses the potential unreliability of the test in the presence of liver disease, heart failure, kidney disease, intestinal malabsorption, pyloric obstruction, and urinary retention due to obstructive uropathy. The effect of the last two conditions seems obvious. In the absence of more precise information about the metabolism of azure A, the effect of the first four conditions does not seem so obvious. Since this test is likely to be used predominantly in the older age group in whom heart, kidney, and liver diseases are common, it appears desirable to obtain more information regarding the reliability of tubeless gastric analysis in the presence of such complicating diseases. The study here reported was designed to gain such information.

Methods and Results

One hundred fourteen patients hospitalized in the Philadelphia Veterans Administration Hospital were studied for the presence of free gastric acid by the intubation method with Töpfer's reagent and immediately thereafter by the tubeless gastric analysis technique using a cation exchange resin azure A compound. The patients in this study were selected because each had a disease state in which the results of the tubeless gastric analysis might be questioned. The patients were divided into the following five categories for purposes of analysis: (1) liver disease, (2) heart disease, (3) kidney disease, (4) diseases of the gastrointestinal tract, and (5) miscellaneous diseases.

In the fasting state the patient was given 1.0 mg. of histamine phosphate subcutaneously as a stimulant to gastric secretion. Forty-five minutes later a control urine specimen was obtained. A no. 18 Levin tube was then passed into the stomach and the contents aspirated and tested for the presence of free hydrochloric acid using Töpfer's reagent as an indicator. The tube was removed and the patient given 2 Gm. of the cation exchange resin azure A compound (containing 90 mg. of azure A) with 240 ml. of water. The urine voided during the two hours following the ingestion of the resin compound was collected as the test urine. This two-hour urine was diluted to a volume of 300 cc. and an aliquot compared with two color standards of azure A, one equivalent to 0.3 mg. of azure A per 300 cc. and the second equivalent to 0.6 mg. of azure A per 300 cc. The control urine collected prior to the ingestion of the resin compound was used as a filter for the color standards to correct for the presence of urinary pigments.

If the color of the test urine was more intense than that of the 600-mg. standard, the test was interpreted as indicating the presence of free gastric acid. If the color was less intense than that of the 600-mg. standard, the aliquot of urine was acidified with 1 drop of 18% hydrochloric acid, placed in a boiling water bath for 15 minutes, and then cooled to room temperature for three hours. This step was designed to convert the colorless form of the dye to its colored form. The urine was again compared with the color standards. If the color was more intense than the 600-mg. standard, the presence of free acid was inferred; if less intense than the 300-mg. standard, the test was interpreted as indicating no free gastric acid; if between the 300-mg. and 600-mg. standards, the test was interpreted as doubtful.

The results of the tube and tubeless determinations are tabulated in table 1. Discrepancies between the two methods are reported in table 2.

Comment

Evidence has accumulated which confirms the soundness of the premise of tubeless gastric analysis, that is, the release in the stomach at pH 3 or lower of a substance which will be absorbed from the small intestine and excreted by the kidney in detectable form. The validity of the test depends upon other factors as well. The conventional gastric analysis, though frequently uncomfortable for both patient and technician, does not require the functional integrity of any other organ. The tubeless gastric analysis, however, assumes normal gastric emptying, standard absorption from the small intestine, uniform circulatory dynamics in transport of the dye, consistent handling by liver and other organs, prompt excretion by the kidney, and complete emptying of the bladder.

Complete plyoric obstruction would preclude absorption of the dye from the small intestine. In the few cases of partial pyloric obstruction that we studied, enough dye entered the small intestine so that no false-negative results were obtained. In patients previously subjected to gastrectomy, the resin compound may not be retained in the gastric stump long enough to permit release of the dye. Shay[7] has reported an occasional false-negative result in a patient who has undergone gastrectomy. Segal feels that keeping the patient supine or on his left side for 15 minutes after the ingestion of the resin would obviate this objection. There is a theoretical possibility that hypermotility might produce the same problem. The incidence of false-negative results reported in a series of ulcer patients, in whom hypermotility might be expected, is so low that this must rarely occur.

Table 1.—*Results of Tube and Tubeless Gastric Analyses in Various Conditions*

Disease Present	Patients, No.	Free Acid Present: Tube	Free Acid Present: Tubeless	Free Acid Present: Discrepancy	No Free Acid Present: Tube	No Free Acid Present: Tubeless	No Free Acid Present: Discrepancy
Liver (39)							
Laennec's cirrhosis	24						
Acute hepatitis	6						
Common duct stone	3						
Hemochromatosis	2						
Hodgkin's disease	2						
Carcinomatosis	1						
Pancreatic carcinoma and obstructive jaundice	1						
		36	35	1	3	2	1
Kidney (26)							
Nephrosclerosis	10						
Chronic glomerulonephritis	7						
Diabetic glomerulosclerosis	4						
Chronic pyelonephritis	2						
Multiple myeloma	2						
Disseminated lupus erythematosis	1						
		20	13	7	6	6	0
Heart (26)							
Arteriosclerotic	15						
Rheumatic	8						
Cor pulmonale	2						
Myocarditis	1						
		20	20	0	5	3	2
Gastrointestinal (13)							
Duodenal ulcer—pyloric obstruction	3						
Gastric ulcer—pyloric obstruction	3						
Gastric carcinoma—pyloric obstruction	2						
Duodenal ulcer	2						
Duodenal ulcer—postsubtotal gastrectomy	1						
Benign pyloric obstruction	1						
Regional enteritis	1						
		12	12	0	1	1	0
Miscellaneous (10)							
Pernicious anemia	4						
Macrocytic anemia, unknown type	1						
Multiple sclerosis	1						
Myxedema	1						
Malnutrition	1						
Sarcoidosis	1						
Diabetes mellitus	1						
		3	3	0	7	6	1
Total	114	91	83	8	22	18	4

To the best of our knowledge, the test has not been performed in a significant number of patients with the malabsorption syndrome. Our one patient with regional enteritis absorbed enough dye to give a true positive test. In our group of 26 patients with heart disease, all of whom were in congestive failure, no false-negative results were obtained. The renal blood flow is apparently adequate for excretion of sufficient quantities of azure A.

The role of the liver in the handling of azure A is unknown. In our group of 39 patients with varying degrees of hepatic failure, one false-negative result was obtained. This occurred in a patient with far-advanced hepatic cirrhosis with evidence of both chronic and acute hepatocellular damage. Several of the patients were markedly icteric at the time of the test. Others had laboratory and clinical evidence of severe hepatic insufficiency and impending coma.

Table 2.—*Summary of Discrepancies Between Tube and Tubeless Gastric Analysis in Twelve Patients*

Diagnosis	*Blood* Urea Nitrogen, Mg./100 Ml.	Miscellaneous Data	Result, Tube Method	Result, *Tubeless* Method
Laennec's cirrhosis	...	Sulfobromophthalein, 40%; bilirubin, *5.6 mg./ml.; cephalin* flocculation, ++++	+	−
Metastatic carcinoma of liver	...	Sulfobromophthalein, 40%; bilirubin, 10.8 mg./ml.; alkaline phosphatase, 48 Shinowara units*	−	+
Glomerulonephritis	60	...	+	−
Glomerulonephritis	84	...	+	−
Glomerulonephritis	120	...	+	−
Nephrosclerosis	180	...	+	−
Diabetic glomerulosclerosis	114	...	+	−
Diabetic glomerulosclerosis	80	...	+	−
Chronic pyelonephritis	118	...	+	−
Rheumatic heart disease	...	...	−	+
Arteriosclerotic heart disease	...	...	−	+
Macrocytic anemia (unknown type)	...	...	−	+

* Shinowara and others (*J. Biol. Chem.* 142:921, 1942).

Far-advanced renal disease was the one condition in which we found a significant incidence of false-negative results. In the presence of severe renal insufficiency, an inadequate amount of the dye is excreted. In our group of 26 patients there were seven false-negative results, an incidence of 27%. These occurred in patients whose blood urea nitrogen level was more than 60 mg. per 100 ml. In patients with moderately severe renal disease whose blood urea nitrogen was less than 60 mg. per 100 ml., the results of the tubeless gastric analysis were in agreement with those of the aspirated gastric specimen. The presence of urinary retention due to obstruction at the vesical neck or elsewhere makes the test unreliable unless catheter emptying of the bladder is employed.

Recently Poliner, Hayes, and Spiro[8] reported an incidence of 75% false-negative results. This contrasts sharply with the low incidence in our group. In 42 patients in whom there were negative or doubtful results by tubeless gastric analysis, Poliner and his group found that 26 had free acid when tested by intubation following histamine stimulation. The authors point out that this high incidence of false-negative results may have occurred because 500 mg. of caffeine sodium benzoate was used as the gastric stimulant for the tubeless analysis, whereas histamine, a more potent stimulant, was used for the conventional analysis. The tubeless and tube studies were also done on different days. In our study in which the determinations were done simultaneously following histamine stimulation, no such discrepancy was noted.

In the 114 patients studied, there were 4 in whom the results could be called false-positive, that is, in whom the tubeless gastric analysis indicated free acid when the gastric aspirate showed no free acid. This incidence of 3.5% false-positives is in close agreement with other reports.

The procedure itself, including testing the urine, is simple and requires little time or training. In our group of 114 patients, 63, or 55%, gave positive results as indicated by dilution of the urine. In the cases of the remaining 51 patients (45%) acidification and heating was required.

Summary and Conclusions

Tubeless gastric analysis has been shown to be a valid procedure for determining the presence of free acid in the stomach. It gives no quantitative data, however, regarding the amount of acid secreted.

One hundred fourteen patients with diseases that might invalidate the results of tubeless gastric analysis were studied with conventional intubation and the tubeless method following histamine stimulation. Seven false-negative results were obtained among 26 patients with renal disease. In these seven patients the blood urea nitrogen level was in excess of 60 mg. per 100 ml. In a group of 39 patients with hepatic disease, one false-negative result was obtained in a patient with far-advanced cirrhosis. The tubeless gastric analysis technique appears to be valid in the presence of heart disease, miscellaneous other diseases, and early to moderately severe liver and kidney disease.

Tubeless gastric analysis will probably be most useful as a screening technique for the detection of gastric achlorhydria. Its simplicity makes it readily adaptable for use in large numbers and as an office procedure.

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The cation exchange resin azure A compound used in this study was supplied as Diagnex Blue with translucent color standards by Dr. Henry A. Strade of the Squibb Institute, New Brunswick, N. J.

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J.A.M.A., May 10, 1958

COMPLICATIONS IN POSTERIOR FOSSA DUE TO OCCIPITAL TRAUMA—THEIR OPERABILITY

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Among 135,000 patients admitted to a hospital and clinic in a large, rural area, 296 underwent roentgenographic examination of the skull because of injuries to the back of the head. A fracture of the occipital bone was found in 98 patients, 32 of whom had severe complications. The 21 cases here described involved lesions in the posterior fossa and included 2 fatal cases of intracerebellar hemorrhage. There were eight cases of extradural hemorrhage in this region; decompression or removal of clots was followed by complete recovery in seven of these. The eighth was not relieved by making a bur hole in the occipital region; he died following a lumbar puncture, and autopsy revealed both an extradural hemorrhage and a bilateral subdural hematoma. Subdural hematoma was found in four patients, three of whom died; it is believed that all might have been saved had bur holes been placed in both supratentorial and infratentorial regions. Subdural hygroma occurred in seven patients, and all survived; more rapid improvement resulted from the making of bur holes into the posterior fossa to permit the escape of trapped cerebrospinal fluid and to reduce the intracranial pressure. In the past, attention has been focused on lesions to the surface of the cerebral hemispheres; these cases show that similar attention should be given to the structures in the posterior fossa.

Trauma to the occipital region of the head may cause hemorrhages resulting in death if surgical intervention is not accomplished. Little recognition has been given to injuries specifically confined to the posterior portion of the skull. Sporadic case reports indicate that hemorrhages in the posterior fossa as a result of trauma are operable lesions. The frontotemporal region, in contrast to the occipital region, has long been recognized as an area in which dangerous extradural arterial bleeding may occur as a result of a fracture in the region of the middle meningeal groove. This report is made to stress the importance of recognition and operability for hemorrhages and fluid accumulations in the posterior fossa as a result of cranial injury.

Approximately 135,000 patients have been admitted to the Hitchcock Hospital and Clinic, Hanover, N. H., which is a center of a large, rural area. Many patients with serious head injury must travel a long distance for neurosurgical attention, best accomplished in the one central hospital. Three hundred cases were found in which trauma to the occipital region of the head was the cause of the patients' seeking medical attention. Every patient showed evidence of local trauma, such as a scalp hematoma or laceration, to the occiput. Roentgenigraphic examinations were made on all but four patients. Of the 296, 98 were found to have fractures, which varied in their appearance, in the occipital bone. Of the 98 patients having a fracture of the occipital bone, 32 presented serious complications; and of the 198 not having a fracture, only 14 presented serious complications.

In order to understand adequately the pathology of this condition, a brief preview of the anatomy of the posterior fossa is necessary. The region of the brain below the tentorium is made up of pons, medulla oblongata, and cerebellum. The dura mater, arachnoid membrane, and pia mater envelop the brain. However, dura mater houses large venous channels—the transverse sinuses and the torcular Herophili—which lie immediately below the occipital bone. The subarachnoid space is continuous over the cerebellum and fans out into the cisterna magna. Thus, cerebrospinal fluid intimately accompanies the cerebellar contour and medulla oblongata through a rigid rim—the foramen magnum. The important arteries (vertebral and basilar) do not course in the occipital bone. The arterial supply of the cerebellum originates in the ventral portion of the posterior fossa. Because of the general anatomic situation of structures in the posterior fossa, the pathology of this area when injured is the same as that of the supratentorial region. Though lesions in the infratentorial region are comparatively rare, it is apparent from the series here reported that they must be anticipated in cases of occipital trauma.

The various lesions seen at the Hitchcock Hospital over a course of 20 years (1936-1956) include the following, which will be described: (1) extra-

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Read before the Ninth Clinical Meeting of the American Medical Association, Boston, Dec. 2, 1955.

dural hemorrhage, eight patients (one death), (2) subdural hematoma, four patients (three deaths), (3) subdural hygroma, seven patients (no deaths), and (4) intracerebellar hemorrhage, two patients (two deaths).

In addition to the cases to be discussed, there were eight in which a tear in the transverse sinus was found and no hemorrhage was seen above or below the tentorium. Traumatic contusions of the cerebellum and intracerebellar hemorrhage are extremely rare, and we believe that subdural hygromas occur more commonly in the posterior fossa than has been described.

Extradural Hemorrhage

Hemorrhage into the extradural space as a result of trauma will compress the central nervous system in the cranial or spinal portion. As a result of cerebral compression either above or below the tentorium, neurological deficit, coma, and death will result. As contrasted with the bleeding of the middle meningeal artery in the supratentorial region, bleeding in the posterior fossa is generally of venous origin, and, in some cases, days, weeks, or, as in one observed case, months may pass before the compression will necessitate surgical intervention. The incidence of extradural hemorrhage in the posterior fossa is estimated at 0.3% of all craniocerebral injuries and 7% of all extradural hemorrhages, although this figure may be overestimated.

The reports of this lesion in the literature are summarized in table 1. The first significant report was made by McKenzie[1] in 1938. He recognized that this hemorrhage might arise primarily below the tentorium or might extend secondarily from hemorrhage above the tentorium as a result of a middle meningeal artery tear. His comments were interesting: "I have never heard of extradural hemorrhage over the cerebellum. If a diagnosis could have been made, operation would have been simple and recovery almost certain." He recognized that prompt diagnosis and surgical therapy would have saved all of his patients.

Coleman and Thomson[2] first successfully removed a clot in the posterior fossa of a 9-year-old child who had fallen backward and struck his head. The patient had been sent home from the emergency room of the hospital twice before the diagnosis was established. A midline fracture was present from the lambdoidal suture to the foramen magnum. The patient was operated on, and he recovered. Kessel,[3] shortly after this, also operated on a patient with such hemorrhage, and he indicated that patients with supratentorial hemorrhage from the transverse sinus had been operated on successfully.

After these initial reports, subsequent reports not only indicated increasing awareness of the lesion's occurrence but also presented great variation in clinical symptomatology and neurological signs. Most cases occur as a result of a backward fall, and the patient shows external evidence of occipital injury; however, one case was described as resulting from forceps injury in a newborn infant. Unconsciousness may or may not occur, and some patients have shown a lucid interval after an initial period of unconsciousness, only to relapse into coma—indicating serious medullary compression. Noting the period prior to medullary compression led Hooper[4] to classify cases as acute, subacute, or chronic. In certain patients coma, vital sign disturbance, and an enlarged pupil may be evident within 24 hours after injury, while in others two to seven days may pass before a desperate situation evolves. Headache, ataxia, nystagmus, dizziness, and a tendency to lie on one side will be followed by lethargy and decerebrate rigidity. Papilledema may be found, as well as a paralysis of the 3rd, 6th, 7th, 9th, and 11th nerves. Hypotonia and a stiff neck are common.

TABLE 1.—*Cases of Extradural Hemorrhage of Posterior Fossa as Reported in Literature*

Author	Yr of Report	Total Cases	Patients	
			Recovered, No	Age, Yr.
Wharton	1901	2	1	12,24
Duret	1922	2	0	...
McKenzie	1938	3	0	...
Coleman and Thomson	1941	1	1	9
Munro and Maltby	1941	1	0	...
Kessel	1942	1	1	24
Turnbull	1944	1	1	38
Watts	1944	1	1	6
Fleminger and Smith	1946	1	1	16½
Gordy (reported also by Gross	1948	1	0	Young
Anderson	1949	1	1	5-12
Bacon	1949	1	1	27
Grant and Austin	1949	1	1	26
Herren and Zeller	1950	2	0	60,49
Bonnal	1951	1	1	
Campbell and Cohen	1951	1	1	2 wks
Munslow	1951	2	0	20,25
Schneider, Kahn, and Crosby	1951	1	1	43
Lemmon and Schneider	1952	3	3	52,14,11
Beller and Peyser	1952	3	1	18,27,18
Campbell, Whitfield, and Greenwood	1953	5	4	8,9,8,66,6
Hooper	1954	7	4	20,49 8,15, 2,16,36
Saleeby, LeFever, and Harmon	1954	1	1	30
Present report	1957	8	7	51,12,4,6, 3,1½,15,50
Aronson and Ransohoff	1958	1	1	42

The bleeding has been found to arise mostly from the transverse sinus or at the junction of the sinuses (torcular Herophili). Due to a tear in these large venous channels, hemorrhage may compress the cerebellum and brain stem rapidly. Most patients will be found to have a fracture of the occipital bone by x-ray or at the time of operation, but it should be stressed that not all will show evidence of a fracture. The fracture may be found in any part of the occipital bone. Depressed fragments have rarely been reported.

The reports of five cases by Campbell[5] in 1953 and seven cases by Hooper[4] in 1954 have been the most numerous and informative. Both reports originated in large cities. In Campbell's report, four of five patients were under 10 years of age, and in Hooper's, five of seven patients were under 20. In our series, six of eight were 15 years of age or under and three of the eight were female. Most of the patients were referred a short time after their injury, and they were in relatively good condition. All patients presented evidence of occipital trauma, but two showed no fracture by x-ray examination. Signs of cerebellar injury were found in only three and papilledema in only two. Of the seven patients that were operated on, recovery occurred in all. *The one patient who died, in 1939, had bur holes in the supratentorial region only.*

TABLE 2.—*Summary of Findings in Eight Cases of Extradural Hemorrhage of the Posterior Fossa*

	Case							
	1	2	3	4	5	6	7	8
Age, yr.	51	12	4	6	1½	15	3	50
Sex	M	M	F	F	M	M	F	M
Time elapsed after injury before admission, days	1	4 hr.	1	4 hr.	5	9	1	9
Coma	+	+	+	—	+	—	—	+
Vital sign change*	BP↑	BP↑	P↑	—	P↑	—	P↑T↑	—
Lucid interval	+	—	—	—	—	—	—	+
Evidence of occipital trauma	+	+	+	+	+	+	+	+
Fracture of occiput	+	—	+	—	+	+	+	+
Nystagmus	—	+	—	+	—	—	+	—
Ataxia	—	+	—	+	—	—	+	—
Facial weakness	—	+	—	—	—	—	—	—
Hemiparesis	+	—	—	—	—	—	—	—
Babinski sign	+	+	—	+	—	—	—	—
Enlarged pupil	—	+	+	—	—	—	—	—
Deviation of eyes	—	+	+	—	+	—	—	—
Papilledema	—	—	—	+	—	+	—	—
Active sinus bleeding	—	—	—	—	+	—	—	—
Bur holes in posterior fossa	—	+	+	+	+	+	+	+
Survival	—	+	+	+	+	+	+	+

* BP, blood pressure; P, pulse rate; and T, temperature. Arrow indicates rise.

The following case reports are drawn from our experience (table 2).

CASE 1.—A 51-year-old male fell from a tree and struck the occipital region of his head. He walked to a doctor's office and was admitted to hospital Jan. 13, 1939. He vomited blood and soon was unconscious. There was a laceration of his right occipital region. He could not move his left arm and leg. His blood pressure was 200/100 mm. Hg; his pulse rate was 64 per minute. A Babinski sign was present on the right side. A bur hole was made in the occipital region, and no hemorrhage or contusion was found; however, the brain was under tension. Three days after admission, a lumbar puncture was done. The cerebrospinal fluid pressure was 270 mm. H_2O, and 10 cc. of fluid was removed. He became cyanotic and stopped breathing. The postmortem examination disclosed a fracture of the petrous ridge which extended to the right lateral sinus and foramen magnum. An extradural hemorrhage was present in the suboccipital region, and a bilateral subdural hematoma also was found.

CASE 2.—A 12-year-old boy was driving a tractor when it fell over. He was unconscious and taken to a local physician. His blood pressure was 148/68 mm. Hg, his pulse rate was 80 per minute, and he was drowsy. When taken to the hospital, he was found to have a contusion of the left forehead and a laceration of the occipital region. The eyes were deviated to the right, and a nystagmus to the right was noted. Reflexes of the right biceps and triceps were increased. There was a Babinski sign on the right. His condition was better the next day, but the nystagmus persisted. The left pupil was much larger than the right, and a facial paralysis was present on the right side. Decreased hearing of the right ear was noted. The child was seen to stagger when walking, and he showed confusion on the fourth day of hospitalization. On the ninth day, an extradural clot was removed from the posterior fossa. The child recovered, but the facial paralysis persisted, necessitating a hypoglossal-facial nerve anastomosis six months later, which resulted in some return of facial function.

CASE 3.—A 4-year-old girl was admitted to hospital six hours after having been struck by a horse's hoof at a race track. She was unconscious and had been since the injury. She vomited and was bleeding from the mouth. The pupil on the right was larger than that on the left, but both reacted to light. The pulse rate was 146 per minute, and the blood pressure was normal. She remained in coma. X-rays disclosed multiple fractures of the frontal, parietal, and occipital regions. Three days after admission an extradural clot, measuring approximately 30 cc., was removed from the left side of the posterior fossa. The child's condition was improved, and she was discharged 10 days later without neurological deficit.

CASE 4.—A 6-year-old girl fell downstairs and struck the back of her head. She did not faint or lose consciousness but vomited several times, was nauseated, and became sleepy. She was admitted shortly after injury; her examination disclosed normal vital signs, and she appeared well. However, she walked with a broad-based gait and showed ataxia. Nystagmus was present, more to the right than to the left. She was discharged with persistent nystagmus on the fifth hospital day. X-rays of her skull disclosed no fracture. She was readmitted six days later with severe suboccipital headaches and vomiting. Nystagmus was present, as was early papilledema. On the 11th day after injury, an extradural clot was removed from the posterior fossa. All of her signs cleared after one month, and her condition became normal.

CASE 5.—A 1½-year-old child fell from a car five days before and from a couch one day before admission. He was admitted to the hospital with a large hematoma in the occipital region. He had a pulse rate of 120 per minute. The eyes were constantly deviated to the right, without evidence of nystagmus. A fracture was present in the left occipital bone. The child also was found by examination to have a dermal sinus. His hemoglobin level, preoperatively, was 9.6 Gm. per 100 cc., and his hematocrit was 32%.

An extradural hemorrhage, measuring 50 cm., was present over the posterior fossa and the occipital lobes. A depressed fracture in the occipital region protruded into the transverse sinus. This was removed with furious bleeding. The sinus had to be sutured. The patient recovered without neurological deficit.

CASE 6.—A 15-year-old boy sustained a blow to the right occipital region nine days prior to admission, but was not unconscious. The area was tender, and two days prior to admission diplopia was noticed. He was admitted to the hospital with this complaint. His examination showed normal vital signs. His neck was somewhat stiff, and there was a paralysis of the left abducens nerve. Papilledema was present. An arteriogram showed no abnormality, and x-rays of the occipital region disclosed a fracture. An extradural hemorrhage was present underneath the fracture site; this was removed. The paralysis of the abducens nerve was immediately worse postoperatively and then became considerably better; the papilledema also was worse for a short period of time. A lumbar puncture done one week after surgery showed the cerebrospinal fluid pressure to be 240 mm. H_2O initially, and the fluid was clear. The child's condition has subsequently become normal.

CASE 7.—A 3-year-old girl struck her occiput when knocked to the sidewalk by a large dog. She was not unconscious, but she became dizzy and confused and began to vomit repeatedly. The local physician noted nystagmus. When admitted to the hospital the next day, she was lethargic and her pulse rate was 120 per minute. Her respiration rate was 28 per minute and her temperature 101.4 F (38.5 C) rectally. A fracture was revealed on the right side of the occipital bone by x-ray. Bur holes in the posterior fossa disclosed a liquid and solid extradural hemorrhage 35 cc. in volume. She improved after operation and was discharged four days later. Slight ataxia was present in the hands one month postoperatively; follow-up examination six months later disclosed no abnormality.

CASE 8.—A 50-year-old man with muscular dystrophy accidentally struck the back of his head and was unconscious for a short period of time. He complained only of headaches for nine days, when he became suddenly comatose with extensor rigidity. He was brought to the hospital and was found to have a stiff neck and a minor occipital laceration. X-rays disclosed a right occipital fracture. A large, extradural clot in the cerebellum was removed immediately by surgery. He had a stormy postoperative course characterized by adrenal insufficiency and pneumonia, but he recovered and returned to his original status six months later.

Subdural Hematoma

The literature on the subject of subdural hematoma is sparse, indicating that instances of subdural hematoma in the cerebellar region are rare. Munro,[6] in reviewing 62 cases of subdural hematoma in 1934, described a patient who died as a result of bur holes being made in the supratentorial region for treatment of a subdural hemorrhage which lay both above and below the tentorium. Coblentz[7] removed a subdural cerebellar hemorrhage in a newborn hydrocephalic infant. He cited four cases that had been described previously—all were diagnosed at autopsy. Max Peet, in Brock's excellent textbook[8] on injuries of the central nervous system, says in reference to cerebellar subdural hematomas, "Rarely they are found over the occipital poles or the cerebellar hemispheres."

Webster and others,[9] reviewing 300 cases of penetrating cranial wounds, found 10 with cerebellar injury. The first patient reported was found to have a massive acute subdural hematoma, which was successfully operated on. Other case reports are infrequent, but mention must be made of the report of Achslogh,[10] in which a chronic subdural hematoma of the posterior fossa was described as successfully removed. No injury had been sustained by the patient, and he had had symptoms 14 months prior to surgery.

There are four cases in our series (table 3), and only one was in a child. In all cases, the patients showed subdural hemorrhage in all three cranial fossas, and only in one was surgery performed above and below the tentorium, with survival. An occipital fracture was found in only two. All patients were comatose, and two had presented a lucid interval. The patient who survived is the most recent in the series.

CASE 1.—A 62-year-old man fell downstairs two days prior to admission. He was admitted ambulatory to another hospital when he became unconscious and incontinent of urine; he had had a great deal of headache and vomiting prior to becoming unconscious. On admission to our hospital, he was semiconscious and his temperature was 103.8 F (39.9 C). His blood pressure was 180/95 mm. Hg, and his pulse rate was 120 per minute. His respiration rate was 28 per minute. He showed marked rigidity of his neck, he was incontinent of urine, and all deep reflexes were depressed. He moved his right arm less than his left. A fracture in the left occipital bone was found. A lumbar puncture showed an initial cerebrospinal fluid pressure of 220 mm. H_2O, and the fluid was grossly bloody. The day after he was admitted, he showed improvement, although he was still quite confused and a facial paralysis was present on the right side. Three days after admission, he showed drowsiness and his neck was a great deal more rigid. Lumbar puncture showed the initial pressure too low to read, and the patient died shortly after. Postmortem examination disclosed subdural hemorrhage of the left side of the brain and cerebellum present in the anterior, middle, and posterior cranial fossas. Necrosis of the frontal lobe was found, and an intracerebellar hemorrhage was also found in the right occipital region.

TABLE 3.—*Summary of Findings in Four Cases of Subdural Hemorrhage of Posterior Fossa*

	Case			
	1	2	3	4
Age, yr	62	4	48	51
Sex	M	F	M	M
Coma	—	—	+	+
Lucid interval	—	—	—	+
Fractured occiput	—	—	+	+
Subdural hemorrhage in anterior and middle fossas	—	+	+	+
Hemiparesis	+	—	—	—
Nystagmus or ataxia	—	—	—	—
Bur holes above and below tentorium	—	—	—	+
Survival	—	—	—	+

CASE 2.—A 4-year-old girl fell down a flight of stairs and struck her head. She was immediately admitted to another hospital. She was transferred to our hospital 24 hours later, and died in the emergency room. A postmortem examination disclosed a fracture in the left occipital region extending forward to the temporal bone and to the foramen magnum. A subdural hemorrhage was present in the posterior fossa around the pons and the medulla, and this was also present in both the anterior and middle cranial fossas, although not as extensively. Petechial hemorrhages were found in the occipital lobe on both sides.

CASE 3.—A 48-year-old man fell from a tree, struck his head, and became unconscious. He regained consciousness, and tenderness was present in the occipital region of the scalp. The neck was supple. He was sent to the hospital, and a fracture was disclosed in the occipital region. This was elevated, and a tantalum plate was inserted. The patient showed drowsiness five days later, and eight days later his blood pressure was 200/80 mm. Hg. Lumbar puncture disclosed an initial cerebrospinal fluid pressure of 430 mm. H_2O. Bur holes revealed a subdural hemorrhage on the left side. Nine days after admission, Babinski signs were present bilaterally, and he stopped breathing. He died shortly after. At postmortem examination the fracture was found to be present in the occipital region and to extend to the lateral sinus. A thrombus was present on the petrous sinus, and there was much subdural hemorrhage in all three cranial fossas.

Case 4.—A 51-year-old man fell downstairs and struck his occiput. He was unconscious for 15 minutes and had a slight headache after this. Admitted to another hospital, he became drowsy, had a stiff neck, and vomited. He lapsed into coma 24 hours later, had two convulsions, and became incontinent. His blood pressure was 180/100 mm. Hg. Neither Babinski sign nor nystagmus was present. No fracture was found in the occipital region, despite his having a rather extensive hematoma of the scalp. Bur holes were made both above and below the tentorium; these disclosed 60 cc. of clotted blood above the tentorium and 35 cc. below. His postoperative course was extremely stormy as a result of pulmonary complications, and a tracheotomy was done. He was discharged in five weeks with his condition considered to be normal. He developed post-traumatic epilepsy, which was controlled adequately by diphenylhydantoin (Dilantin) sodium.

Subdural Hygroma

Cerebrospinal fluid may accumulate in the subdural space below the tentorium. These collections of fluid give rise to signs and symptoms of increased intracranial pressure, as well as to signs of distress in the local medullary and cerebellar regions. The cause for this fluid accumulation is not well understood. The literature in the past has been concerned with subdural collection of fluid in the supratentorial area, and Haynes[11] has stated, "I am not familiar with hygromas located elsewhere than over the cerebral convexity. Basilar, interhemispheric and posterior fossa hygromas, while anatomically possible, must be extremely rare."

Table 4.—*Summary of Findings in Seven Cases of Subdural Hygroma of Posterior Fossa*

	Case						
	1	2	3	4	5	6	7
Age, yr.	3	19 mo.	20	2	55	4	10
Sex	M	M	F	M	F	F	F
Time elapsed after injury before admission	6 hr.	1 d.	6 d.	2 hr.	6 hr.	6 hr.	1½ hr.
Coma or stupor	+	+	+	+	+	+	+
Fractured occiput	+	+	—	+	+	+	—
Evidence of occipital trauma	+	+	—	+	+	+	+
Nystagmus	+	—	—	—	—	—	+
Ataxia	+	—	—	—	+	—	—
Facial weakness	+	—	+	+	+	—	—
Babinski sign	—	+	—	+	+	+	+
Enlarged pupil	+	—	+	—	+	—	—
Papilledema	—	—	—	—	—	—	+
6th nerve paresis	+	—	+	—	—	—	—
Bur holes in posterior fossa	+	+	+	+	+	+	+
Survival	+	+	+	+	+	+	+

The cause of fluid accumulation has generally been assumed to be a tear in the arachnoid membrane, although Heyl and Small[12] have questioned whether this fluid accumulates in the subdural space as a result of altered permeability of the arachnoid membrane. Naffziger,[13] in 1924, said, "Subdural fluid accumulations after head injury seem to have escaped the comment of pathologists and surgeons. We do feel that, nevertheless, in such cases there is temporary benefit by the removal of fluid from the spinal canal." He indicated that these collections of fluid were seen with some cases of cerebral hemorrhage. Dandy[14] first used the term "hygroma" for collections of subdural fluid which occurred in trauma and mastoid infections and stated that these collections do not cause many neurological signs. Grant[15] has said that this lesion may account for a progressive or persistent intracranial disturbance after a head injury, status epilepticus, acute mania, or motor weakness. He also believed that spinal puncture helped to relieve the headache of these patients.

In analyzing our data (table 4), it appears that those cases in which there were significant and compressing collections of subdural fluid in the posterior fossa have occurred in young people. The neurological findings to indicate pathological conditions in the posterior fossa were not consistently significant, although most patients showed evidence of injury to the occiput accompanied by a fracture. Only one patient presented papilledema. All patients survived, being treated with bur holes in the posterior fossa.

Case 1.—A 3-year-old boy was struck by a car and became unconscious immediately; though he soon roused, he later became drowsy. He vomited at least eight times on the way to the hospital. A laceration was present in the right occipital region, which had been sutured at another hospital. There were normal vital signs, but a dilated pupil was present on the right and a Babinski response on the left. He became stuporous overnight. X-rays disclosed a widening of the occipital bone synchondrosis. Bur holes placed above and below the tentorium disclosed a hygroma of the posterior fossa 20 cc. in volume and present on the left side. He regained consciousness immediately but had a paralysis of the left abducens nerve and walked with a wide-base gait for a period of at least one month. These signs then disappeared completely.

Case 2.—A 19-month-old boy was hit by a car but did not lose consciousness. He vomited several times. When admitted to hospital, he had a temperature of 101 F (38.3 C) and a pulse rate of 124 per minute with respiration rate of 44 per minute. He became drowsy and, later, stuporous. His head was held to the left, and his left knee jerk was increased. He had a severe fracture of the right occipitoparietal region. Two days after admission, bur holes disclosed a cerebellar subdural hygroma 20 cc. in volume. The arachnoid membrane was visualized, and the fluid was outside of this; it was present bilaterally in the posterior fossa. Postoperatively, the child's head was held straight and he regained full consciousness. He developed a wound infection in the suboccipital region, due to Staphylococcus aureus, which was treated and cleared with antibiotics.

Case 3.—A 20-year-old girl, involved in a car accident, was thrown out of a car door and landed on the back of her head. She was unconscious and remained so. No fracture was visible. At another hospital temporal bur holes were made bilaterally without disclosure of a hematoma but showing increased intracranial pressure. She was unconscious on admission to this hospital six days after her injury. She could not be aroused and did not respond to pin prick. Her vital signs were normal. Weakness of the right arm and left side of the face was noted. A bilateral abducens paralysis was found, and a bilateral Babinski response was present. On the 16th day after her injury, bur holes were placed in the suboccipital region; these disclosed a subdural hygroma measuring 40 cc. in volume. On the fourth postoperative day she was able to talk and swallow. She subsequently recovered all function, with the exception of loss of vision in the left eye, due to a presumed optic nerve avulsion, and a bilateral palsy of the sixth nerve, which was repaired recently by muscle transplants.

Case 4.—A 2-year-old boy, while riding a tricycle, was hit by a car. He was unconscious but later showed movement. A large bruise was present over the posterior part of his head. He was admitted within an hour of his injury and was decerebrate. He had a stiff neck and fixed, dilated pupils. His pulse rate was 138 per minute. His respiration was shallow, at a rate of 10 per minute. He was pale and cyanotic, and he was bleeding from his nose and mouth. A linear fracture was present in the occipital bone from the transverse sinus to the foramen magnum. There was a fracture of the left tibia and fibula. Bur holes were made immediately, and a large bilateral hematoma was removed from the posterior portion of the occipital region. Bur holes in the suboccipital region disclosed a large subdural hygroma under severe tension. A cast was applied to the bones of the left leg. The child responded well three days after surgery. He is perfectly normal at the time of writing, three years after his injury.

Case 5.—A 55-year-old woman was involved in a car accident and was rendered unconscious after striking the back part of her head. She was in profound coma and was decerebrate, with enlarged, fixed, dilated pupils. Her pulse rate was 124 per minute. A laceration of the left frontal region had been sutured outside the hospital. There was also evidence of occipital trauma. A facial weakness was present on the left, and a bilateral Babinski sign was noted. A fracture was disclosed in the right occipitoparietal region. Bur holes, done above and below the tentorium, disclosed a subdural hygroma 40 cc. in volume in the posterior fossa. Ataxia was noticed postoperatively in the movements of her hand. Her temperature and pulse became abnormal, and she had extremely irregular respiration. She was subjected to hypothermia for a period of three days, and she eventually recovered. She was discharged after two months to a convalescent home and has shown further improvement, although she is unable to walk by herself and has disclosed palatal myoclonus. Her mentality is not adequate for her to care for herself.

Case 6.—A 4-year-old girl was run over by a car, and she immediately became unconscious and cyanotic. She was bleeding from her left ear. A fractured left humerus was present, as well as a depressed fracture in the left parietal-occipital region. This was elevated. The fracture was accompanied by a subdural hygroma in the posterior fossa, which was under pressure. The patient remained unconscious for a long period of time, and there was a right hemiplegia postoperatively. After five days she responded to pain, and she recovered normally in three months. An electroencephalogram done one month postoperatively showed a disorganized eight-per-second alpha wave in her occipital region and a five-per-second wave throughout her entire record.

Case 7.—A 10-year-old girl tripped and struck her head on a rock. She was not unconscious, but within 5 or 10 minutes she noted numbness in the left arm and within 15 minutes inability to walk and drowsiness. There was a dysphonia but not aphasia. She was admitted to the hospital 90 minutes after injury. Examination showed her to be completely disoriented and wildly irritable; there were bilateral Babinski signs, drowsiness, and restlessness. X-rays revealed no skull fracture. Bilateral supratentorial bur holes showed only increased pressure. Forty-eight hours later, focal left-sided seizures began, which resulted in a virtual status epilepticus. Reexploration of the bur hole on the right side again revealed nothing. The status epilepticus, which was always focal on the left side, continued for two days, and, finally, 80 hours later (three and one-half days after the trauma), early papilledema was noticed, a fine nystagmus was present, the neck was stiff, and bur holes in the posterior fossa revealed a cerebellar subdural hygroma, 50 cc. in volume, under pressure. The protein in the cerebrospinal fluid was 100 mg. per 100 cc., as against 7 mg. per 100 cc. in the ventricular fluid. After this, she immediately began to improve; within 24 hours her seizures were under control, and within 48 hours they had ceased. Four days after removal of the subdural hygroma, she was moving her left side and starting to talk. Twenty-one days after the removal of the hygroma and 25 days after admission, she was able to walk from the hospital with almost no neurological deficit.

Comment

Traumatic lesions of the suboccipital region which may be successfully operated upon are relatively rare, and only recently has the literature indicated that such operation is possible. These lesions display their signs in a much less pronounced fashion than others, and their development may be slower than that of a lesion in the supratentorial areas, such as an extradural hemorrhage. However, it should not be forgotten that some of these hemorrhages may develop quite rapidly.

In most of these cases, the patient will show an occipital fracture. Extradural hemorrhages of the posterior fossa may be successfully diagnosed and operated on, and the long-term results are equally as good as for those patients with supratentorial extradural hematoma.

It is evident that bur holes must be placed in both the supratentorial and infratentorial regions in order to have the patient survive. Bur holes are never adequate in examination and treatment of an occipital injury in either the supratentorial or infratentorial region alone. If, in three of our patients with subdural hematoma, bur holes had been placed in both the supratentorial and infratentorial regions these patients would have survived.

The presentation of seven cases of subdural hygroma of the posterior fossa needs further comment. These lesions have been found as a result of our being overcautious about traumatic pathology in the posterior fossa for which a successful operation may be performed. One wonders if the patients would have survived if no surgery had been performed. Perhaps they might have; however, we question whether convalescence might have been prolonged, and we also question the final neurological status. From what we have found at the time of surgery, we assume that the dural incision allows excess fluid, which has arisen in the subarachnoid space and has become trapped in the subdural space, to escape.

The surgical technique is relatively simple. A midline incision is made from the inion to the region of the second cervical vertebra, and bur holes are placed in both sides of the posterior fossa after the muscles and fascia have been separated. If there is no lesion present in the extradural space, the dura is always opened to inspect the subdural area and the cerebellum. Endotracheal anesthesia is always used.

Summary

Serious complications due to occipital trauma may arise in the area of the posterior fossa. Such complications, including extradural and subdural hemorrhages and subdural hygromas, may be successfully operated on. Patients with injury to the occiput, who have a fracture or evidence of local hematoma with progressive embarrassment of vital signs, prolonged coma, or progressive cerebellar signs, should be subjected to surgical exploration. This is carried out by placing bur holes both above and below the tentorium.

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UNDERGRADUATE MEDICAL EDUCATION AND THE CHANGING STATUS OF PATIENTS

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The general consideration of this panel is to center on the problems of specialty training that are resulting from the changing status of patients. I have been asked to discuss this same development from the standpoint of undergraduate education. While sequence may make the separate consideration of undergraduate and graduate education a reasonable division of labor, the facts of their interdependence and the educational principles and concepts that they must or should share in common makes it impossible for me to think about either one without the other. Because of this, as I have developed my assignment, by both implication and digression, I have had to make some reference to specialty education. Just as the undergraduate experience should be supportive to the graduate, I hope that what I have done will provide a useful background for the papers that are to follow.

I assume that in referring to "the changing status of patients" we mean that the time is at hand when almost every individual, on his own, through insurance or through some other mechanism, will be obtaining medical and hospital care on some kind of a remunerated basis, thus doing away with socioeconomic inadequacy as the factor which forces patients to the teaching services of our medical schools and hospitals. I believe that this assumption is valid because, as a trend, it is already apparent and also because it is a reasonable part of this nation's pattern of progress—a development that is coming out of the complicated interaction between medicine's increasing effectiveness, our

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Executive Director, Association of American Medical Colleges.
Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

rising standards of living, and a social awareness that is steadily placing a higher premium on human resources and dignity.

Change, even progressive change, is always associated with problems. But as our teaching programs in medicine react to the improving socioeconomic status of patients, I hope we will assert sufficient care so that we may not only dissipate and prevent problems but, at the same time, strengthen and improve our system of medical education. In other words, I hope that what we may do will represent an adjustment to change that will work in the interests of further progress.

This paper does not represent an effort to finalize the difficult line of reasoning that this approach would involve. Such is not within the capacity of any one individual. However, in order to be provocative on the one hand and yet not to appear indecisive on the other, I am going to indicate the reasoning I would offer if I were a member of a group of highly motivated, knowledgeable individuals who might be brought together to give our problems the intensive study and deliberation they deserve.

Adjustment to Change

I would first urge that all of the thinking and discussion be in line with the best possible medical education and that nothing be considered or accepted that would compromise this principle. This would be particularly productive because it would let us look to the future of medical education and what it ought to be without being side-tracked by present confusions and tensions.

Next, I would want the group to understand my concept of some of the background against which its deliberations should take place. In developing this, I would want to emphasize the importance of the growing relationship between the undergraduate and graduate levels of education. This could be accomplished by pointing out that, as medical facts, techniques, and concepts have grown in number, complexity, and importance, the stature of medicine has reached the point where it has had to be broken down into learnable parts. As a consequence, specialty training—the concerted learning of one of these parts—is becoming a must for every physician. Even general practice (I prefer the term general medicine) should require special training two to three years beyond internship. All of this means that the four years of medical school, the only formal-professional education that all physicians will have had in common, must take on special significance.

I would then want the group to appreciate the two things that are particularly unique about medical education. The first of these is that, instead of the usual two-way teacher-student relationship found in most educational situations, in medicine three personalities are involved: the student, the teacher, and the patient. Furthermore, this patient needs help and, almost by instinct, seeks—even creates—a situation in which he becomes dependent on his physician. Insofar as possible, the student must become this physician. The student must have the opportunity to bring the knowledge and interest that result from intensive study into an active and responsible participation in the evaluation and management of human health and illness. Thus, the second thing that is unique about education for medicine is the peculiar situation in teaching institutions and services which makes this three-way relationship between student, teacher, and patient an effective educational operation.

Definitions in Medical Education

In order to complete this background and also to cross a bridge that would lead to considerations I would want to develop later on, I would next ask this group to consider the attributes and implications of four commonly used terms which can be very important to the changing status of patients and to the problems that are related thereto and can be solved therefrom. Without arranging them in any particular order, I would offer these considerations by asking and discussing a series of questions: 1. What is a student of medicine? 2. What is a medical teaching institution and a medical teaching service, as contrasted to a nonteaching institution or service? 3. What is a teaching patient? 4. What is a medical teacher?

Student of Medicine.—I realize that all physicians and medical scientists should be students throughout the duration of their professional lives. But, for the purpose of this question, I would define a student of medicine as an individual who is engaging in full-time study either as a matriculant in an undergraduate school of medicine or as an appointee in an approved internship or residency. The undergraduate experience must prepare for the graduate. As a consequence of this, the objectives of the two differ, in that the former is aimed at developing the fundamental principles applicable to the whole body of medical knowledge, at establishing habits of reasoned and critical judgment of evidence and experience, and at developing the ability to use these principles and judgments wisely in solving problems of health and disease. It is not the aim of the undergraduate experience to master the complete, detailed, systematic body of knowledge concerning any of the medical and related disciplines. This must be held in abeyance for the graduate years, when the student will undertake to become as proficient as possible in the complete, detailed, systematic body of knowledge and in the techniques and the judgments required to excel in the one discipline of his choice. (The sense of this statement of objectives is taken from "Functions and Structure of a Modern Medical School," Council on Medical Education and Hospitals and the Association of American Medical Colleges, 1957.)

Since all physicians must go through this combination of experiences, it is basic to my definition that, as the student learns and increases in proficiency, he moves from lower to higher levels of patient responsibility. The undergraduate experience is one in which increasing responsibility is paralleled by close supervision; the graduate is one in which, as the capacity for independent responsibility increases, close supervision is gradually withdrawn, the ready accessibility to consultation taking its place.

Medical Teaching Institution.—Next, I would define a medical teaching institution or service as one in which the education of physicians and medical scientists is continually taking place. The administration, library, laboratories, service programs, research activities, and staff organization are centered on the student and the staff-student management of the patient. This complex of resources and activities must be so arranged and operated that good teaching, good research, and good patient care are not compromised. In contrast to all of this, in the nonteaching institution or service the organization of all resources and activities is centered on the individual practicing physician and his management of his patient. Good patient care is the only concern, and any teaching or research that may take place is secondary, often incidental.

It is the presence of the undergraduate student that constitutes the essential difference between the medical schools and their hospitals and the teaching services of the non-medical-school-connected institutions. But the graduate student is common to both. In addition, while the medical school situation may pose peculiar problems and call for special resources, since both the medical schools and the teaching services of the non-medical-school hospitals are in the important business of graduate training, I submit that our definitions and concepts of education must be such that, as far as fulfilling their missions is concerned, both must be in a position to strive for the same degree of excellence. If this is to be so, I believe that the day should soon come when specialty training in the non-medical-school situation should be limited to those institutions that can have on their staffs the basic as well as the clinical scientists essential to the best possible program.

Teaching Patient.—What is a teaching patient? With the thought in mind that I am still meeting with a group that is considering the impact of the improving status of patients on medical education, I would define a teaching patient as an individual who elects to enter a teaching institution or service, who, on admission, knows that his care is to be in the hands of the staff-student team, and who knows that, if there is good reason, his case may be approached from the research standpoint. Every individual so admitted must serve as a teaching patient, and the number or pool of teaching patients must be such that the clinical problems in which the student is to become involved can be selected so as to satisfy the needs of his particular level of learning. The pool must also be such that a student's clinical load is neither too large nor too small and not out of balance as to age, sex, or clinical entity and particularly as to socioeconomic status. If this last imbalance is to be avoided, it means that all individuals—the financially independent as well as the insured—must be eligible for care in the teaching situation. To use only insured patients for teaching would still limit the student's experience to but one segment of society.

I would point out that, at the present time, the clinical experience of too many students is limited to the low-income patient. This is not good education. Socioeconomic factors, particularly those of want and plenty, have important selective influences on the etiology, course, and prognosis and also on the evaluation and management of both health and illness. As a consequence, there is every reason for placing all students of medicine in a responsible relationship with individuals, both sick and well, from all walks of life, in their homes as well as in the outpatient or inpatient departments of the hospital.

Teacher of Medicine.—Finally, I would define a teacher of medicine as one who, in the field of medicine, possesses superior professional, scientific, and technical knowledge and experience and who, because of his ability to communicate and demonstrate this knowledge and experience, can motivate and inspire students to want to learn and, at the same time, provide proper leadership for this learning effort. I would have to take the position that, unless an individual possesses all of the attributes expressed in this definition, he should not be appointed or assigned to teaching responsibility.

Principles for the Changing Status

At this point, I would expect someone in the group to comment that, while I had made myself clear as to the background and uniqueness of medical education and as to my definition of the elements that play the key role in this phenomenon, I had yet to spell out the principles that would translate the changing status of patients into benefits for both education and care. This comment could well be reinforced by a reminder that the planning and building of a curriculum, faculty, and facilities into an effective educational unit takes not only time but also continuing stability and that the thing that would be of most benefit would be the financial independence essential to the satisfaction of these conditions.

In response to this, I would have to express the opinion that the changing status of patients should lead to a socioeconomic situation in which more, perhaps most, of the people in the United States would have freedom to select their health and medical care from a wide spectrum of choice; further, the institutions organized and operated for teaching purposes, as well as those that are not, should be eligible for such choice; and, finally, the factor of competition thus injected into the situation should serve the best interests of both patient care and education. This is particularly important if high standards of service could stand as the main criterion on which competition would be based. High standards could have no better safeguard.

While I would advocate eligibility of the teaching program for competition, I would be the first to recognize that this competition should be held within bounds. An educational program should not be in business for business' sake. The patient load should be no larger than that needed to satisfy educational and research responsibilities and objectives. The financial benefits should be held in line with standard practice. And, conversely, if an individual should choose a teaching situation for his health or medical care, no special financial benefit should accrue either to him or, if he is an insured patient, to his insuring agency.

Benefit to the Over-all Institution

Finances.—At this point, I would anticipate another interruption from my group, particularly from the university presidents and chancellors, asking just how all of this could fit into and benefit not just the medical school but the over-all university as well. I would expect this question to be amplified by the reminder that the programs of most medical schools place great, even detrimental, strain on the already limited financial resources of their parent universities and that if something could happen so that the above-average costs of medical teaching and the professional and hotel costs involved in service could be met from the sale of service, those universities with medical schools, as well as the schools themselves, would benefit immeasurably therefrom.

I would certainly agree with the reasonableness of this viewpoint, but in doing so I would want to caution the group that the deliberate exploitation of service programs in the interests of general university financing could not be justified. I would expect agreement on this point. but, again, I think the chancellors and presidents would insist that the earned income from service should fully compensate for the manner in which clinical teaching and service distorts the medical school budget, as compared with the other units of the university.

Again, I would agree. But, in addition, I would have to point out that, even though most medical schools enjoy budgets that seem disproportionately large, they still fall short of their needs, to the detriment of their teaching programs. While medical schools in the United States may not be permitted to operate on deficit financing, they can conduct deficit education. Time would not permit me to go into great detail here, but within many schools I could point out that the inability to finance the strengthening of certain programs or departments and to establish and maintain others is cutting short the quality education that medicine should offer. That the improved socioeconomic status of patients could play an important part in helping to correct these difficulties could be demonstrated by the fact that those schools presently with the fewest academic deficits are those that can admit patients who pay their own way. As my group would leave this portion of its discussion, I am certain it would agree that, if the improved socioeconomic status of patients was to be meaningful to medical education, its benefits would have to apply equally to all schools—rich and poor, strong and weak, large and small, tax-supported and private.

Faculty Policies.—With the encouragement that would come out of the hope of improved financing, I am sure that at least one university president would ask to hear discussion of faculty policies as they would apply to appointment, work time, and remuneration as between the school of medicine and the rest of the university. At this point, in order to be sure of a lively discussion. I would offer two definitions of "full time." The first of these would be strictly in line with the literal connotation of the term; the second would show deference to the fact that, while universities and medical schools might be using part-time faculty, the full-time concept should still apply.

The first definition: a full-time faculty member is one whose entire professional output. except for the privilege of occasional consultation, publishing, and speaking, is obligated to the university and is one who is reimbursed on this basis. The second: a full-time faculty member is one whose entire professional output, during the hours or days of his assignment, is obligated to the university and who is reimbursed on this basis.

Both definitions would imply that all faculty would be fully reimbursed by the university for the period of obligated time and that during this time there would be no demands on professional output from any other source. There would be no unpaid faculty, and there would be no faculty engaging in independent practice within the framework of the university program. Since the resident physicians render highly significant service to both teaching and patient care, particularly during the latter half of their appointments, I would bring them under the blanket of these definitions by appropriate faculty designations and also by remuneration far in excess of that which most now receive. This measure alone would do much to take the curse out of the presently long and expensive struggle for a complete medical education.

In short, it would be my thesis that the school of medicine, with its constellation of programs, students, patients, faculty, facilities, and financing, should be brought under the same kind and degree of control that the university exercises over its other colleges and programs.

Unaffiliated Schools.—Before this meeting could break up, I would expect someone to point out that, if all undergraduate education were to be under the aegis of the university, what about the fact that many medical schools have no connection with universities? My answer to this would have to be that any new institutions without university affiliation should not be established and that we should hope for the eventual university amalgamation of those presently in operation. I would also have to add that, in the meantime, these institutions should be allowed to receive the financial and other benefits envisioned in this discussion so that they could become universities in their own right, broadly polarized around human biology and its social, as well as its scientific and medical, implications.

Present Problems

The discussion of this hypothetical group has been a long and interesting one, and, as adjournment has taken place, I want to come back to earth and deal with a few of the realities of the present.

First, while much of my discussion has seemed to single out the university and medical school situations for special treatment, I think that with the use of a few different words the sense of my thinking could be made equally applicable to the teaching services of the non-medical-school-connected hospitals. Improvement as to income and income stability could go far in strengthening these important programs.

Also, it was with considerable reluctance that I included the intern in my definition of a student of medicine. In the eyes of many, the internship has reached the point where it is of dubious value as an educational experience. The circumstances that originally surrounded its establishment no longer pertain, and present trends in both undergraduate and graduate education are such that the time may be at hand when students should go into specialty training directly from graduation.

Returning now to the wind-up of my group meeting, I would expect most of the conclusions which would be reached to be quite different from the situation which medical education faces today. And I think things should be different. The differences I have in mind are tied to the provision of continuing financial stability and the independence and self-determination that go with it. This is the only thing that will protect schools of medicine in the United States from compromises that are inimical to the best possible education.

I do not say that the benefits that can come out of the changing status of patients would solve all of the financial ills of medical education. To particularize, there would still remain the fact of the manner and extent to which research is diluting the teaching budgets of universities and schools of medicine. If all of those agencies supporting research would provide the full cost, instead of only a portion, and if at the same time full compensation for the added costs of clinical service and teaching could be provided, the two most important financial problems presently hampering the growth of medical education would be solved.

We are living in an age which is characterized by rapid change. Such times dictate that action replace umbilical contemplation. With medicine increasing in effectiveness, with our population growing in size, and with our per capita level of education and purchasing power continuing to improve, we must anticipate the narrowing of the gap between medical need and demand and between medical knowledge and performance. The future is certain to call for more and better educated medical practitioners, scientists, and teachers. The degree of success with which we meet this future depends entirely on the performance of the system of medical education. It will take time to correct the financial problems of the schools of medicine and even more time to translate this correction into effective programming.

It is my opinion that, if the medical profession and the medical educators would both support the premises I have outlined, the solution to most of the problems facing medical education would promptly get under way.

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PROBLEMS IN SPECIALTY TRAINING CREATED BY THE CHANGING STATUS OF PATIENTS

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Medical education is facing today one of the strangest combinations of paradoxes imaginable. In the first place, medical schools and voluntary hospitals in the United States have been confronted with the gravest of financial crises in a decade of unprecedented prosperity. In the second place, there is the paradox of rising per diem hospital costs with fewer and fewer patients who cannot meet them. A third and related paradox is that, although as a result of both shorter stay and more beds there is a vast increase in numbers of patients hospitalized each year, there has been a steady decline in patients available for postgraduate teaching. A further complication is the marked increase in the numbers of those seeking postgraduate education.

In order that we may not starve in the midst of this plenty, in order that we may fulfill our obligation to those who will follow us by providing them with the ablest and best physicians we can, we should first identify our problem, then seek to attack it. Visualization and identification of the problem is the purpose of this paper.

Baehr[1] notes four great changes in medicine over the past half-century: *(a)* institution of full-time teachers, *(b)* full-time chiefs of hospital laboratories, *(c)* full-time hospital scientific and educational direction, and *(d)* prepayment plans. Prepayment plans have permitted patients to come to hospitals today having prepaid a sizable portion not only of their hospital bills but of their physicians' and surgeons' fees as well. Since "he who pays the piper calls the tune," most of today's patients choose or are asked to choose a private physician to supervise their care while in hospital. Fewer and fewer patients are available for the intern and resident staff—or so it seems.

As we think of the intern and resident it is well to consider briefly where he is working and learning. One may think that postgraduate medical education in hospitals is taking place in all of the 6,966 hospitals listed by the American Hospital Association (A. H. A.). Recognized and approved programs are conducted in less than 10% of these hospitals, and of these nearly two-thirds are connected with medical schools.

In attempting to assess this problem of the impact of social changes on postgraduate medical education, several approaches were made. Among them were discussions with local confreres, such as John C. Leonard, director of medical education at Hartford Hospital, review of the literature, and letters sent to about 50 friends in the field of medical administration. Of the latter number, 34 replied. These replies were often two and three pages long and frequently included supporting documents. They indicate not only that much thought is being put into this problem but that it is general, for replies came from the length and breadth of United States and Canada, from Montreal, Canada, to New Orleans and LaJolla, Calif. They came from young men in the field and from such elder statesmen as Winford Smith of Johns Hopkins, Joseph Howland of Peter Bent Brigham Hospital, and Nathaniel W. Faxon of Massachusetts General Hospital. Faxon[2] reviewed well the historical background:

> The concept that led to the foundation of charitable hospitals was primarily the provision of a place to care for the sick, poor persons, those who could not be cared for at home. Along with this was the thought that the collection of these sick persons in a hospital would provide better instruction of future doctors. When it was found that they were receiving better medical care by reason of being in a hospital, facilities were provided for the rich and then for the middle class so that now all hospitals provide for the care of all classes.
>
> With such factors as growing prosperity and better wages, there developed the desire in most people to carry their own load and not to accept charity. The depression era put many hospitals into financial difficulties. These two factors produced Blue Cross. Welfare departments likewise broadened their views and accepted, in a limited way, the responsibility for the care of their wards in hospitals, moving them from the old-time poorhouse to the hospital when they were sick. After a long struggle, the welfare departments in many states have accepted responsibility to pay hospitals the cost of this care. Blue Cross has developed from the original idea of a complete service care to the idea of partial coverage with the patient paying part of the care.
>
> Blue Shield introduced another factor when it developed to cover professional charges for Blue Cross patients. This was all to the good, but it did produce an ethical problem, especially in surgical cases, when a patient selected a surgeon because of confidence in his surgical skill and then the surgeon wanted to allow a resident, for the sake of better training and the development of his surgical skill, to do the operation. It is the disappearance of the so-called ward patient, who, paying no professional fee, accepted as his contribution to medical teaching the granting to interns and residents the right to operate, under supervision.

Third-Party Payment for Hospital Care

Consider what has happened over this past quarter-century in the development of means of third-party payment for hospital care and its effect on the teaching program. There are three broad areas of third-party payment: prepayment plans,

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

payment as an obligation of the employer, and payment for care of medical indigents. These should be considered separately.

Prepayment Plans.—Prepayment plans, born of the depression and begun amid serious misgivings on the part of many, no longer need an apologist. The number grew rapidly after World War II to reach a plateau by 1950 (fig. 1). The number of subscribers, on the other hand, has shown a steadier increase until today the A. M. A. reports finding an enrollment of 42,200,000 in approved plans (fig. 2).

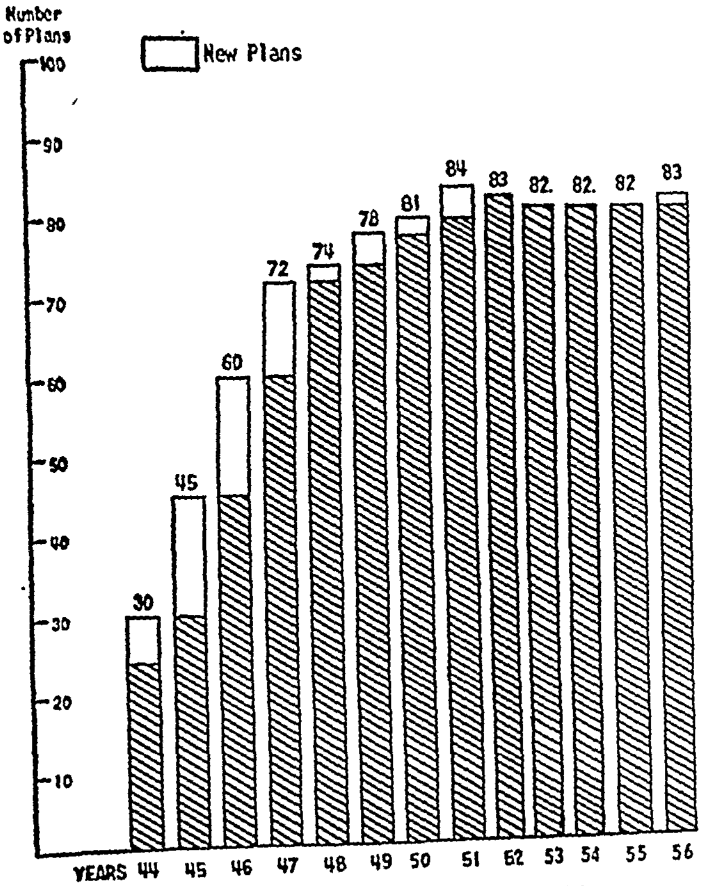

Fig. 1—Growth in number of voluntary health insurance plans approved by medical societies, plus Blue Cross or Blue Shield coordinated plans (Council on Medical Service, A. M. A., June, 1957).

Total plans, as reported by the Health Insurance Council for the years 1955 and 1956, show even greater numbers, since they report persons protected rather than subscribers. A significant point to be made from their charts is that surgical expense coverage, which started later than hospital expense coverage, is catching up to it, while general medical expense coverage, for about half as many persons, is likewise growing rapidly (fig. 3, 4, and 5). Growth of the three major areas over the past 15 years is dramatically shown in figure 6. Coverage, of course, varies greatly, but the important fact is that an increasing segment of the population is prepaying part or all of both hospital and medical-surgical expenses. Some groups, such as those covered by the United Mine Workers Fund, may be provided not only with funds but with the services as well. These groups own, operate, and staff hospitals.

Payment as an Obligation of the Employer.—Awareness of our social obligations has resulted in great changes in the Workmen's Compensation Act. Gone are the days when one worker in the foundry (usually known as "Doc") with a penchant for aiding a stricken brother was the unofficial bonesetter. Today, the employer is responsible for treatment after accidents to his employees, even the foolhardy accidents, which occur on his premises or in his service. Medical care as provided by the employer falls into the following categories:

1. Workmen's compensation, whether in voluntary or proprietary (usually company) hospitals, provides for attendance by a practicing physician. Care of those injured in the course of their employment thus may provide an essential experience for the resident but not at the senior resident level.

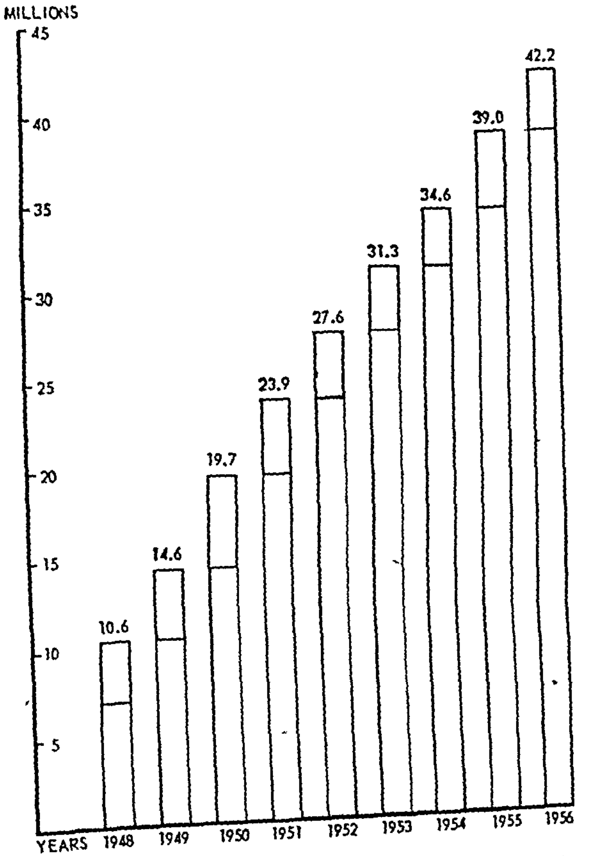

Fig. 2.—Growth in enrollment (1948-1956) in voluntary health insurance plans approved by medical societies, plus Blue Cross coordinated plans (Council on Medical Service, A. M. A., June, 1957).

2. In the military services, all accidents and illnesses are covered regardless of cause.

3. In Veterans Administration hospitals for service-connected and other disabilities the patients, like those in military services, may be cared for by men and women at all levels of postgraduate medical education.

4. In some mechanisms, such as Medicare, the dependents of servicemen come to voluntary hospitals as private patients rather than going to government facilities. Thus, within the past 15 months, a potential source of teaching material (in the old sense) has moved into the same category as those patients covered under voluntary prepayment plans.

5. Possible future mechanisms, such as extension of the Medicare plan to all government employees or such plans as the proposal to use the Social Security system to prepay health costs of the aged, will further deplete the dwindling numbers of service patients.

Payment for Care of Medical Indigents.—Medical indigents are those for whom hospitals were first built and thus have been the teaching material of the past. Payment or prepayment for care of these patients is usually made in one of the two following ways, both often occurring in the same community:

1. Payment may be made by hospital endowments, gifts, and Community Chest grants. Endowments are growing slowly, and, as hospital costs rise, the dollars earned from investments pay for decreasing amounts of patient care. Gifts, too, are not on the increase, except those for specific research projects, and these are limited to the study at hand. Community Chest groups often make grants to support service activities in many large teaching hospitals, but these groups, too, have been hit by rising costs, while new demands for their funds are outstripping increases in levels of giving. In many cities, more than half of the Community Chests' grants go to hospitals where they provide only a small percentage of the hospital's income. Hence, hospitals are turning more and more to the local government for funds.

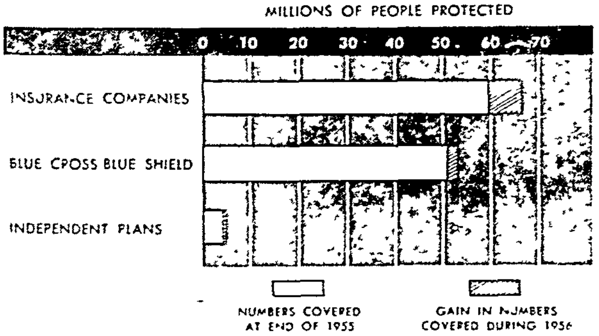

Fig. 3.—Distribution of hospital expense coverage by type of insuring organization (Health Insurance Council, August, 1957).

2. Payment may be made by local government through (1) provision of its own city, county, and state hospitals, or (2) payments to voluntary or proprietary hospitals for care of the patients for whom it is responsible. In the financing of the care for a decreasing number of medically indigent patients, there is a decrease in the percentage cared for by endowment funds or community gifts and an increase in those cared for by government. Government already pays the physician for care of these latter patients when they are not in hospital. If this practice is extended to provide a fee for care of the hospitalized patient, there can be an even further reduction in the numbers of those who have in the past been the patients of the senior residents.

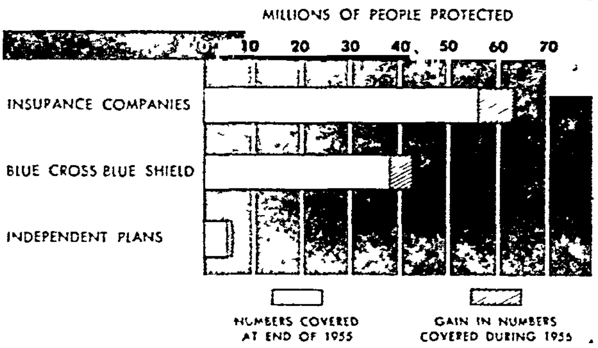

Fig. 4.—Distribution of surgical expense coverage by type of insuring organization (Health Insurance Council, August, 1957).

Prepayment and Type of Patients

As prepayment in its several forms expands to encompass an ever larger segment of the population, the problem is even further compounded by the fact that the remaining service patients (and patients in Veterans Administration hospitals as well) are to be found more and more in the older age groups. Those over 65 years of age are hospitalized oftener for longer periods and have less funds with which to meet these expenses than any other group (see table). There is evident not only a decrease in service patients but a concentration into the older age groups and thus of those with chronic degenerative diseases.

We can conclude that third-party payment plans have permitted many to come to hospitals as private patients who would otherwise have stayed at home or would have entered the hospital as service patients. In order to assess the seriousness of this problem of loss of the old-style teaching material, we must first determine whether the great relative decline in service patients is in fact absolute. In Hartford Hospital, for instance, the percentage of service to total deliveries has fallen during the past 25 years from 50 to 10%, but the number of service deliveries is not much lower now than it was then. In other divisions of medicine as well, we often find decreases in percentages are much greater than decreases in actual numbers of patients. Still, there is no doubt that, thanks to prepayment plans, the decrease in service patients is both relative and absolute.

and medical coverage. On the other hand, there is a steady increase in numbers of men and women seeking specialty training.

Use of private patients for teaching raises several problems, among them how to obtain a uniformly high level of teaching with a multiplicity of teachers who are not equally interested in or equipped for teaching, how properly to define authority and responsibility, and to what extent the patient can be asked to cooperate. The problem of the teaching material for the senior resident, especially in surgery and its specialties, remains the most knotty.

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FUTURE TRAINING IN MEDICINE AND MEDICAL SPECIALTIES

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New medical knowledge has accumulated at a tremendously rapid rate, especially during the past decade. Simultaneously, there has been an increasing demand for improvement in the quality and quantity of medical education, research, and patient care. Financial support for teaching and research has been expanding considerably. Moreover, the financial, social, and general educational status of the public has developed sufficiently to demand marked improvement in medical care. The extent to which physicians are facing the problems is variable, as shown in figure 1, but most of us have been insufficiently progressive in our planning. Large investments are being made in new medical school and hospital buildings, as well as in large staffs; but without adequate study of long-range developments, optimal success will be handicapped. The situation may be compared with the tremendous traffic jams that have developed as a result of insufficient planning in many large cities; making changes later is expensive and much more difficult. Many revisions must be made both in medical training centers and in medical practice. Alterations should be made in the kind of training, research, and practice that should be offered, the facilities provided, the type and scope of coverage given by the physicians involved, and the most appropriate administrative patterns for these activities. Each of these will be discussed.

Full-time Academic Staff and Scope and Type of Their Coverage

The rapid accumulation of a vast number of medical facts has reduced the proportion of medicine that any one physician can master (fig. 2). Despite the great desirability of having each internist know all phases of medicine and in spite of the strenuous efforts which some have directed toward this objective, it is not possible. Thus, there must be a tremendous increase in the number of medical specialists. It is desirable to have specialists in allergy, dermatology, neurology, endocrinology, cardiology, respirology, oncology, genetics, renology, gastroenterology, nutrition, microbiology, hematology, rheumatology, isotope medicine, gerontology, and other fields. Indeed, there are specific departments of medicine that have more than 50 full-time staff members. Since the scope of specialization is frequently relatively small and since many different systems may be involved in a specific patient, criticism is given, frequently with justification, that there is overspecialization and that the patient is not treated "as a whole." Conversely, it may be stated that certain patients may be made "whole" and cease to be patients by consulting the appropriate specialist. Whereas it may be desirable for each physician to have both great depth and great breadth of knowledge, the two usually do not coexist, but it is possible for a group of physicians to offer both depth and breadth and to provide whole-patient care not otherwise available.

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

The efficacy of the plan of having many specialists, contrasted to having chiefly general internists, depends greatly on the extent to which the activities of the physicians are integrated; smooth teamwork is essential both in medical training and in practice. In this connection, Gregg[1] points out that the extent to which specialties may be advantageous or disadvantageous depends on the degree of their coordination. He draws a wonderful analogy to the many segments of the arm. With fewer joints the movements of the arms will be simpler and easier to control but the accomplishments not as great (fig. 3). With increased friction or lack of communication between the specialists, the situation leads to inefficiency as is the case in an inflamed or ankylosed joint. Moreover, when specialists seek too much independence in their activities and fail to participate in a coordinated manner, the net accomplishments may be comparable to those of a flail joint. Thus, the nature of the administrative organization is important and must be considered in detail.

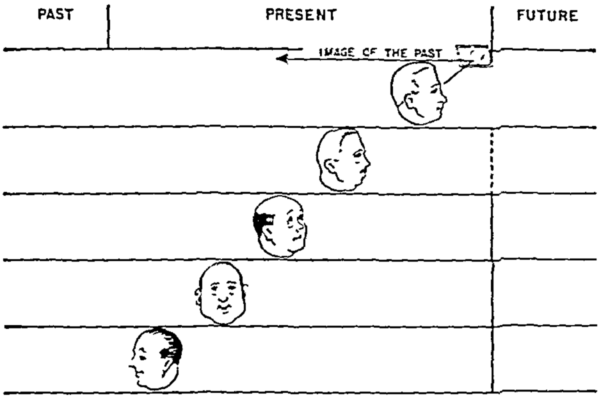

Fig. 1.—Levels of progressiveness of physicians. Top character represents smallest proportion of physicians—after carefully studying past developments he extrapolates probable course of future events; second character gets less clear picture of future because of insufficient study of past—"He who is unfamiliar with the past is subject to its pitfalls in the future"; third character has desire but not ability to visualize future; fourth subject represents largest proportion—those who are not sufficiently interested in past or future; bottom subject dwells in patterns of past and not only fails to contribute to progress but often actively opposes it.

Administrative Organization of the Staff

With the great enlargement of the staff and the tremendous increase in the extent of their specialization, there has been a greater tendency, particularly in departments of medicine and surgery, to subdivide many responsibilities in administration, teaching, research, and patient care. These units are often called divisions. A problem for consideration is how to interdigitate most effectively the activities of a given division with those of other divisions and departments. One problem, for example, is the fact that there may be a full-time endocrinologist in as many as four clinical departments and in three basic science departments. There is often considerable duplication in their knowledge, as well as in their teaching and research. The question may be raised as to whether all seven of these individuals could function more effectively if they were brought together in an integrated division of endocrinology. Certainly, in some ways, the teaching, research, and patient care would improve therefrom. A similar situation applies to cardiology, hematology, neurology, physical medicine, and many other specialties. After some of these divisions have grown large, they have been set up as separate departments, with increased autonomy. The question needs to be answered as to whether such autonomy, if granted to a few specialties, should not be granted to most of the others and whether such arrangements would be advantageous or disadvantageous to medicine as a whole. This problem needs to be analyzed carefully and objectively. In any case, the departmental lines should be crossed by the various specialty divisions more than they have been in the past (fig. 4). Indeed, the question may be raised as to whether it is desirable to replace many of the existing departments with new departments designed in accordance with the greatest possible accomplishments in research, teaching, and patient care that can be offered by a particular specialty. Whereas the type of organization improves some situations, it handicaps others. With a compromise arrangement, diagrammed in figure 5, it seems possible to obtain advantages with relatively few disadvantages. This plan consists in decreasing the intensity of demarcations between departments, whether basic science or clinical, and increasing the crossing of the boundaries by various specialties. The extent to which integration can be satisfactorily accomplished varies a great deal with the personalities involved, as well as with the needs

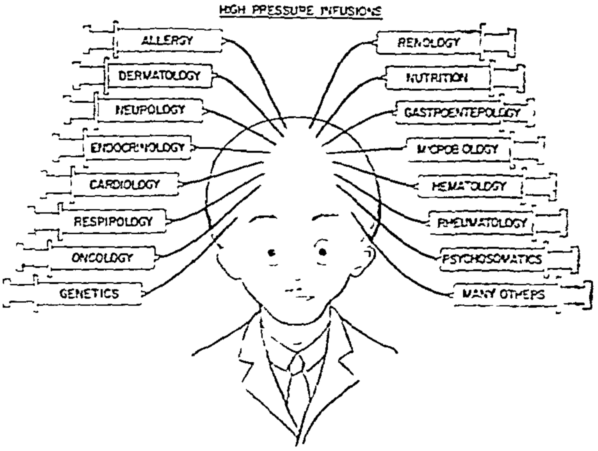

Fig. 2.—Full load of knowledge of all medical specialties: too much for any one physician.

ferent specialists are not particularly needed and could utilize their time better elsewhere. Moreover, it is difficult to have representatives from all the specialties present at one time. In most cases, the specialist believes that he can do a better job in patient care, teaching, and research when the patient comes to his respective clinic. This is because there are many special facilities and special personnel at hand.

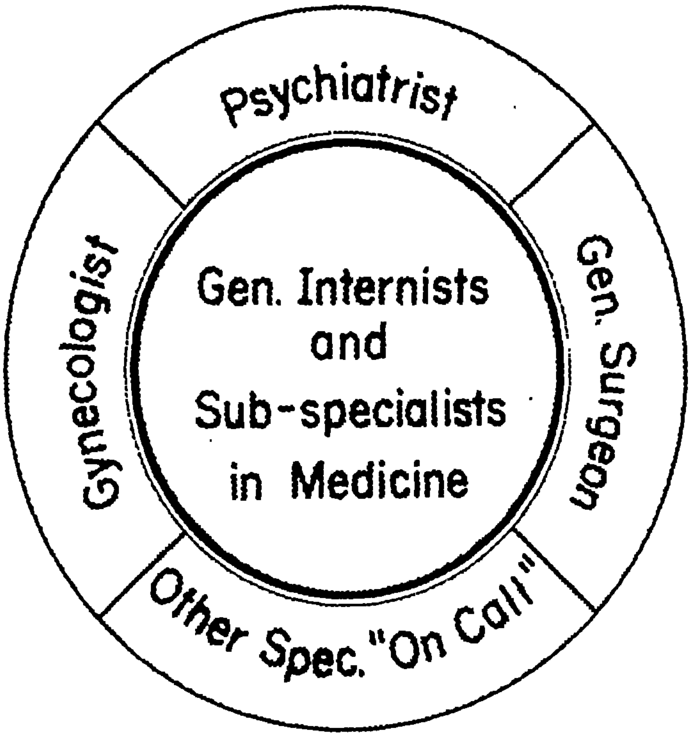

Fig. 7.—General medical clinic should be set up in a manner to provide consultations rapidly by representatives from medical specialties and from various departments additional to medicine. In instances where it is not satisfactory to keep a given type of specialist in the clinic, he should be readily available on an "on call" basis.

The over-all plans should consist of arrangements whereby consultations may be obtained rapidly not only in the general medical clinic from a variety of specialists but also in the other clinics. Such plans not only lead to more efficient patient care, but also assist in teaching and research. Moreover, they conserve time, energy, and money.

In some institutions, much attention has been given to specialty clinics but the general medical clinic has been badly neglected. Indeed, in some instances the case material in the latter is so uninteresting that it affords inferior teaching and does not attract a sufficient number of capable staff members to render optimal patient care. Conversely, other institutions, in a determination to correct this situation, have overcompensated in that they have established an excellent general medical clinic but have unduly withheld good teaching and research material, as well as students and others, from the specialty clinics. It is possible to have good specialty clinics and a good general medical clinic. However, even on attaining a high level in these regards, there is a minority of patients with problems that seem sufficiently diffuse to warrant referral to a different type of clinic, which might appropriately be called a conjoint consultation clinic (fig. 8). The only patients who should be referred to this clinic are those who have already had a relatively extensive examination in some of the other clinics but whose problems continue to baffle the physicians, particularly in that it is difficult to decide on the specialty field that is most involved. In this special clinic, each patient's problems would be carefully considered by several physicians who, as decided on the basis of previous examination of the patient, would be able to offer most to solution of the problems. These physicians would be representatives from any one department or more. Such a clinic could be of great benefit not only in offering good patient care but also in teaching and research. In the past, patients of this type have often received the "run around."

In much of my discussion thus far, as well as subsequently, two key themes are "coordination and collaboration"; with so many individuals involved in so many different ways, particularly in an academic institution, these are imperative. Thus it is necessary that the appropriate spirit prevail and that there is excellent leadership. Since, as discussed earlier, the prime purpose of the university hospital is to be of academic benefit to the medical school, it seems desirable for the head of the hospital to be the dean of the medical school. How-

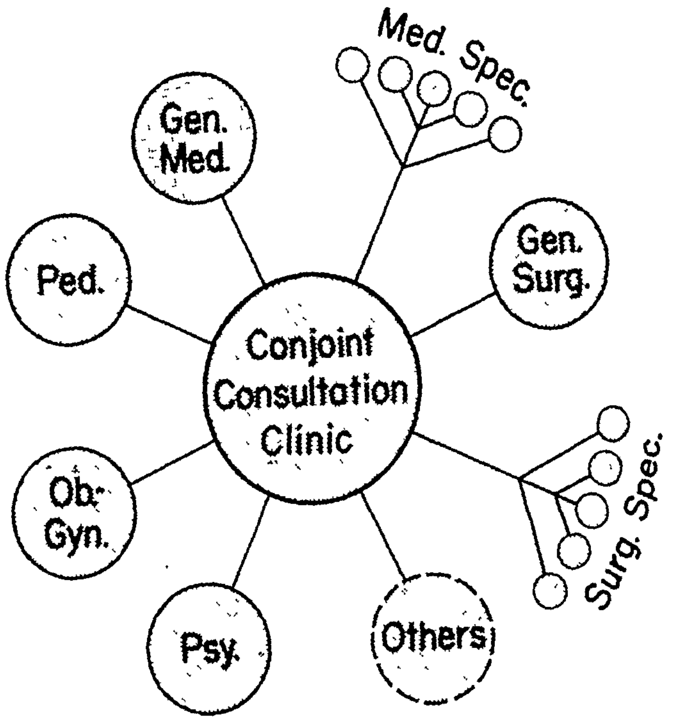

Fig. 8.—Patients assigned to conjoint consultation clinic are ones who have been examined in other clinics but whose problems have not been satisfactorily solved. Object of this clinic is to bring together several physicians representing different specialties, as well as general internists, to discuss all phases of patients' problems.

ever, his duties are so extensive that some must be delegated. With respect to the university hospital, there are two "chief deputies," in particular, whom the dean needs: (*a*) a business administrator and (*b*) a medical director. The business administrator does not necessarily have to be a physician, but the medical director should be an excellent physician. In order to obtain the best person for the latter position, it is necessary for the business administrator and his assistants to handle as much of the business as possible, leaving the medical director to deal chiefly with professional problems. He should have the main responsibility for the assignment of patients, in accordance with policies recommended by a hospital executive committee. He should assist in the smooth coordination of interdepartmental activities, outpatient and inpatient. He also should play a key role in the maintenance of good relations with the practicing physicians and the public.

In addition to this over-all coordinator, the department of medicine needs a coordinator of its own. Such a person would have as his major duty the general supervision and coordination of activities in the general medical clinic and medical specialty clinics (fig. 9).

In the department of medicine, in dealing with inpatients, as with outpatients, a major problem involves designing a system which will offer optimal opportunities for teaching, research, and patient care. Again, it is important to coordinate the activities of the different specialists. A prominent question pertains to whether or not patients should be grouped in wards in accordance with the type of specialists who will handle them. Such an arrangement would benefit research and training of specialists in the field and, in some ways, would benefit patient care. Patient care would not be as good in other ways, e. g., less coordination of care from different specialists. The system also introduces problems relative to balanced training for students and house officers. It may be that this problem can be resolved satisfactorily and that there should be a segregation, but in the meantime it seems best to distribute the patients in the medical service at random.

Since, on a given ward, examination of the patients will be made by many different specialists, students, and house officers, it is important to coordinate their activities in the best manner. Figure 9 shows a plan which has distinct advantages. The major phase of the plan is to have a competent physician serve on each ward as "chief ward physician." Such a person should be an excellent internist; it may be that he will also be a good specialist in one phase of internal medicine, or he may not be a specialist, in which case he would be designated as a "generalist" or "general internist." To the chief ward physician would be delegated most of the authority for supervising the ward. He would have the responsibility of coordinating the activities of the specialists, house officers, research fellows, students, and others and of assuring them of good teaching and research facilities. Moreover, he must see that there is good patient care, and he must collaborate with the coordinator in the outpatient clinics in medicine to integrate the inpatient and outpatient activities.

Clinical Laboratory Facilities

A vast number of laboratory procedures have now been provided for assistance in patient care, but the average physician has been negligent in their optimal utilization. Facilities, space, and personnel have been far too inadequate and have frequently contributed to mismanagement and increased cost of medical care. It is highly important in university hospitals, as well as in many others, to have a person with a Ph.D or M.D. degree spend full time in the chemistry laboratory, a second such person in the microbiology laboratory, and a third in the hematology laboratory. These individuals should supervise the procedures and reports in their respective laboratories, adapt new procedures, and, through their own research, contribute new knowledge. Moreover, they should participate in the teaching of students, house officers, research fellows, and others. The positions should be set up in a manner to attract highly competent individuals. The other clinical laboratories, e. g., electrocardiography and electroencephography, should also be directed by experts, though they probably do not require full-time direction.

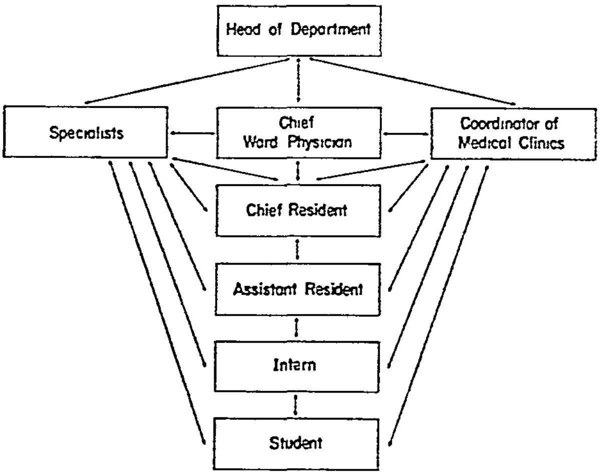

Fig. 9.—Administrative relationships. Proper coordination in teaching, research, and patient care is imperative in a training program. In this figure, the chief ward physician is assigned this coordinative responsibility for ward activities and coordinator of medical clinics for general medical and medical specialties clinic. They must work closely together as well as with other staff members involved. Medical director is coordinator of interdepartmental activities.

Graduate and Postgraduate Training Programs

Internship and Residency.—During medical school training, the student cannot be expected to acquire and understand more than a small portion of the facts he must learn eventually, but he will learn many approaches and methods for procuring data accurately and applying them with balanced judgment. As indicated by Pickering,[2] these are remembered after many facts have been forgotten. Much factual knowledge and excellent experience is gained during an internship. For one who plans to specialize in medicine, a rotating internship is not necessary. Whereas it broadens the prespective with reference to departments other than medicine, it prolongs training. After a straight internship, approximately three years should be spent in residency training by one who wants to specialize in general medicine. During this time, there should be sufficient association with all the medical specialties to allow the resident to become familiar with their major contributions. Moreover, there should be more than casual familiarity with the offerings of radiology, physical medicine, the clinical laboratories, and paramedical services.

Physicians who want to specialize in one phase of medicine should receive at least two years in that specialty, in addition to internship, and two years of residency in general medicine. At present, most of the training is offered as a traineeship or research fellowship, although in some instances a residency in the specialty is offered. Often the latter offers too little research training and the former too little clinical training; a significant amount of each is desirable.

In the past 10 years, there have been several factors which have interfered significantly with the quality and quantity of residency training; chiefly, these include (*a*) military service, (*b*) earlier accumulation of a family, (*c*) low salaries, and (*d*) misleading propaganda to the effect that a short training is sufficient.

Since a good house-officer training program distinctly offers the best practical training, it is a shame to curtail this unduly, particularly since, in most instances, eight years of college work has been obtained as a foundation for this training. With the marked decrease in physician "drafting" into the military service during the past year, this hinderance to training has become much less prominent. However, it is still desirable for the physician to finish his residency before obligatory induction. Past experience has demonstrated that many who have been inducted before completing training either do not complete it or obtain suboptimal training.

Low salaries for residents have played a prominent role in curtailing training. Many residents accumulate heavy debts, since they have a wife and several children to support. In most hospitals, residents' salaries should be increased markedly and, for senior residents, should be more than doubled. These individuals play a highly important role in teaching, research, and patient care. In addition, the chief resident handles many significant problems. In the good larger medical centers, he should receive no less than $6,000 per year. Considering the fact that the number of paying patients is rapidly increasing, it should be possible to take care of the pay for the senior residents via professional fees. They should be licensed and carry malpractice insurance. The fact that this group is still receiving training is not significantly deterrent, because the better ones are more competent and have better facilities and supervision available than many physicians in practice. With considerable increase in salaries there will not be the urge to hurry into practice nor will there be so much of a tendency to "sock the fees" to make up for the many years of financial suffering. Moreover, when the individuals do enter practice, they will be more mature and better prepared in many ways and should accumulate a clientele more rapidly. In the final analysis, the public as well as the medical profession will benefit.

It would seem advisable for some of the better community hospitals to employ full time, or at least half time, certain physicians who have just finished an excellent training to lead the house-officer training program. Such a program would be appealing to some of the young physicians while they are becoming established in the community. Moreover, it might often lead to a great improvement in the training program of these hospitals and better patient care, could prove to be of great assistance to many of the practicing physicians, and, in turn, would benefit the public.

Research Fellowship and Traineeship.—This type of training is essential preparation for most full-time academic positions and provides distinct advantages even for those who enter practice. The number of research fellows and the quality of their training has increased considerably in the past decade, but much additional progress is necessary. In general, those clinicians entering academic medicine should receive much more training than previously in fundamental aspects of research. Many have not received sufficient training relative to general objectives, experimental design, scientific critique, statistical analysis, and written and oral presentation of papers. Moreover, many are deficient in their knowledge of instrumentation and of pertinent laboratory procedures. Since there is a great increase in the number of basic scientists who are becoming full-time staff members in the departments of medicine and since they spend much more time in the laboratory than the clinical group, they are qualified to do a good job in helping to teach principles and methodology of research; this trend should be encouraged by assuring these individuals adequate salaries and prestige.

In general, it seems advisable for the research fellow to spend two years receiving this type of training; he can then become more independent, usually being able to work in a senior research fellowship position. However, there has been inadequate financial support for this stage of senior experience, although some granting agencies have offered splendid support to a few candidates.

The total pay for research fellows should be significantly increased, although ordinarily there is not so great a salary deficiency in this category as there is in the senior resident group. The duration of residency training and the previous research experience should be considered in establishing the level of financial support.

Traineeships vary considerably. Some are similar to residency training, some are like research fellowships, and others are intermediate to these extremes. This flexibility is good, in that it permits adjustments for the needs in individual trainees.

Postgraduate Training.—With the rapid accumulation of new medical knowledge and the frequent modifications of diagnostic and therapeutic procedures, postgraduate training should increase markedly. There should be a better organization, systemization, continuity, and progression in the training courses offered. Several courses, one to two days in duration, as well as one of one to two weeks' duration, should be taken annually. A course one to two months long should be taken every three to five years. Examinations should be given for the benefit of postgraduates and their instructors in order that the most appropriate instruction may be planned. The course should contain more discussion by the participants, more training in methodology, and more case demonstrations.

Changes in Patterns of Practice

In line with the earlier discussion, relative to the need for a great increase in specialists and the concomitant greater need for coordination of their activities, various patterns of group practice will grow significantly. These groups will consist of representatives from many different medical specialties, as well as a few general internists. The larger clinics will also consist of many specialists in fields additional to those in medicine. There will continue to be a rapid decrease in the "broad-spectrum" general practitioners but an increase in "nonsurgical family physicians."

In general, the fees for internists, compared with the attention given to patients, are insufficient compared with those received by physicians in other fields of medicine, but justifiable increases are occurring.

Summary and Conclusions

The marked changes in recent years in social and economic conditions, the tremendous increase in medical knowledge, the great improvement in medical facilities, and the increased desire of the public for improved patient care, teaching, and research emphasize the importance of thorough and immediate provision of optimal future plans along these lines. There is a need for a great increase in specialists, but it is highly important that their activities be coordinated with those of other specialists and with physicians dealing with more general aspects of medicine. Greatest progress can be made by careful, calm, thorough, and objective discussions by many representatives of the medical profession.

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RAW EGG WHITE AND BIOTIN.—At Yale, under Dr. Arthur Smith, I was investigating certain renal changes in rats on very high casein rations. Dr. Mendel suggested that in my thesis these changes should not be attributed to a protein effect unless the same results were obtained with the use of a protein which was not rich in phosphorus: he advised the use of powdered egg white. The tests confirmed the renal effects obtained with casein, but surprisingly, produced some quite different symptoms in addition. To clear up that piece of serendipity, I was kept busy, back at Wisconsin, for several years. . . . The solution of the puzzle came in fragments from several laboratories, a peculiar protein, avidin, in egg white reacts with the vitamin biotin in the digestive tract so that the bound biotin cannot be absorbed, thus sometimes creating a deficiency. Proper cooking of the egg white keeps it from interfering with biotin. Healthy adults, under normal conditions, probably are always capable of producing a protective amount of biotin in the digestive tract. Nevertheless, the extent to which raw egg white was used in hospital diets at one time, on the assumption that it was an especially digestible food, was an undesirable practice.—H. T. Parsons, Ph.D., In the Days When Vitamins Were New, *Journal of the American Dietetic Association,* April, 1957.

ASPECTS OF PEDIATRIC RESIDENCY TRAINING

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Before any consideration can be made of the problems of pediatric training created by the recent changes in medical practice, it is desirable to state the ideal requirements for a graduate pediatric training program. Since the importance of health supervision is emphasized more in pediatrics than in the other special fields, we must recognize these two main areas; (1) treatment of the ill child and (2) guidance of the physical and mental health of the well child. In the first category, we are interested in experience both with the more severe and dramatic, although much less common, illnesses of children and also with the common minor illnesses. In the second category, we need to give instruction and experience in the fields of normal nutrition, physical and mental growth and development, and regimens for infectious disease prophylaxis. We are concerned here with pediatric specialty training, but we must always keep in mind the sometimes similar and sometimes different problems posed in undergraduate teaching, in the preparation of general practitioners, and in giving experience in the special problems presented by children to candidates for other specialties. In terms of clinical facilities, the requirements to provide for this instruction have been met in the past by an inpatient and an outpatient children's service of a general hospital or in a separate children's hospital. In general, residents helped care for the private patients in the inpatient service by taking histories, by performing physical examinations, and by aiding in certain technical procedures, but decisions regarding therapy were usually made by the attending private physician. The resident staff's rticipation in decisions regarding therapy was sually limited to the service patients. The student rarely participated in the care of private patients at all, although these patients might be used for demonstration at some teaching exercises.

Changing Aspects of Pediatrics

The changes that have occurred in pediatrics have been somewhat different from those in specialties dealing primarily with adults, in regard both to service status and to the type of illness. The increasing use of hospital insurance and the appearance of specialized governmental programs have had a definite effect in shifting the classification of patients from service to private categories, especially in more highly industrialized cities where some of the children's hospitals have as many as 85% in the private category. However, I do not believe this shift is as noticeable in pediatrics as in other fields, since many insurance plans do not include the children. Even when some hospitalization is provided for the child, the physician's fee may not be included or the fee provided to the physician may be insufficient to make it feasible to change the medically indigent service patient to a private category. For this reason, this type of insurance or "agency" patient is frequently admitted to the teaching hospital as a service patient. If changes of category occur, they are allocated to an attending pediatrician on current assignment, but almost complete resident responsibility for therapy is maintained.

Another mitigating factor in this field is that the difference in accommodations for private and service patients is less noticeable in pediatric departments than in the other hospital areas. It is common practice to group children in the hospital according to age, sex, and type of illness rather than according to private versus "ward" accommodations, since children are better off together, if possible; however, a given infectious disease requires single-room isolation regardless of economic status. It is also easier to make use of a child's illness for a bedside teaching discussion without worrying about stepping on the toes of a private physician or having the family become concerned that their private physician is not doing his job.

Of more fundamental importance to pediatric services than the change in economic status have been the changes brought about by advances in medical knowledge that have resulted in a different type of illness in the hospitalized child. Improvement in nutrition has almost eliminated the need of inpatient care of children for disorders resulting from this cause, while wide application of immunization and the introduction of antibiotic therapy have made an even greater change in the diagnostic categories of admitted children. It should be recognized, however, that this same widespread antibiotic therapy has called for the admission of new types of patients, namely, those with resitant infections and those with toxic reactions to the antibiotics. The loss of much of the acute infectious and nutritional illnesses has been felt more by those hospitals depending on referred patients than by those close to large areas of indigent families. This change in diagnostic categories has been noticeable in all hospitals to some extent, however, and has required an adjustment in teaching methods.

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

Availability of Patients

Where the shift to private status has interfered with the resident's assuming responsibility for sufficient patients (or, if the time should come when the medically indigent patients disappear), it is important that agency patients and private patients be used to augment service patients. The assignment of private patients to residents for diagnostic examination is generally accepted, but it is still difficult for the attending private pediatrician to meet with the resident on a busy service for a discussion of the care of his patient. This is an obligation of the private pediatrician that must be stressed, and he must be urged to give the resident as much independence as possible regarding therapy. It has been my experience that the failure of this liaison can be mitigated to some extent by having the regular ward attending pediatrician include all the private patients on his rounds. It only takes a little experience and tact to be able to discuss the diagnostic and therapeutic efforts of a fellow physician so that it is a valuable learning experience for the student or resident without infringing on the position of the attending private physician.

The Training Experience

The availability of hospitalized patients is the first facet of the problem, as discussed above, but sufficient opportunity to care for ambulatory patients and well children is of equal importance. One of the fundamental changes in pediatric practice has come about with the decrease in emphasis on the pediatrician's role as a consultant and an increase in that as a "physician to children" in health and for minor as well as for more severe illnesses. While one should not underemphasize the importance of special training in the severe illnesses peculiar to childhood that demand hospitalization, it is important to provide supervised experience in these other fields. In some areas, the regular outpatient clinics provide adequate opportunity for experience of this kind. It is becoming increasingly evident, however, that the opportunity should be available for long-term follow-up of the same children by a given resident in order to give him an appreciation of the many factors that influence a child's physical and emotional health over a period of time. The practice of assigning a resident to the outpatient clinic for one morning a week through his entire service has provided this opportunity, in contrast to the former custom of assigning him for a short block of time, as a reult of which he had little opportunity for long-term observation of a given patient. It is equally important that the pediatric resident should have training in the health supervision of children over a considerable period of time in a clinic for well children. The opportunity for extended contact with the same family for a period of months is especially valuable in gaining experience in the field of emotional problems. There is a growing emphasis on training in this aspect of child care that must be encouraged by making the training a worthwhile part of a resident's service. If the period is too short, the resident may end up with feelings of frustration that will seriously handicap his effectiveness in practice.

When the outpatient opportunities are limited, there are many other sources of clinical material to supplement the children available at the main teaching hospital. The most common is the use of public child health conferences, crippled children's clinics, or special agency-supported clinics, such as those for cerebral palsy or mental defects. There are, however, certain disadvantages in dealing only with indigent groups, in that their responsiveness and their ability to carry out suggestions or therapeutic regimens may be limited when compared to the clientele of a practicing pediatrician. It is possible to cover this deficiency of training satisfactorily by three means. One is to assign a resident to be part-time physician of a residential children's home. In this position, he makes daily calls to see sick children. Some of these children would correspond to the ambulatory patients seen in office practice, others would require bed care in the infirmary, thus resembling bed care at home, while others with more serious problems might need transfer to the hospital. The fact that the resident is on call for emergency conditions gives him an opportunity to participate from the onset in those illnesses in which early diagnosis is important, such as appendicitis, pneumonia, and meningitis. In institutional practice of this nature, the infirmary nurse can serve as a surrogate mother with excellent effect if she is the right type of person.

A second device that provides long-term care more closely simulating private practice is to assign residents to a special service for the families of students and other members of the house staff. This is especially applicable in medical school affiliated hospitals where the number of married students or members of house staff with children creates a sizable group. The resident gains a valuable experience while caring for these more sophisticated families and can call in whatever consultants he wishes for a given situation. This arrangement usually is well accepted by both the pediatric resident and the family.

Preceptorship training offers a third technique. This may be through passive observation of a practicing pediatrician in action, or the resident may spend a period of days (Saturdays, for example) or weeks working along with a practitioner or even take the place of a practitioner as a locum tenens. I believe the last would not be as desirable, however, as a situation in which a licensed resident takes the place of one of a group of practitioners.

In such an instance, one or more experienced practitioners are available for advice and support and for discussion of certain other aspects of practice, such as economics. The difficulty with protracted preceptorships is in the planning on the part of the teaching service. Unless one has a plethora of residents, it is not convenient to let one give up his regularly assigned duties to take over a locum tenens at the sporadic times they become available or convenient for the preceptor. This is a possibility for improved training, however, that might be profitable in some situations. A somewhat similar problem is presented in "farming out" residents to smaller hospitals that do not have approved training programs of their own. There is a great demand on the part of these hospitals that the larger teaching hospital send them residents, but this must be approached carefully. If appropriately chosen, the small hospital can provide the resident with a closer approximation to the type of patient seen in private practice and can give him a greater degree of responsibility than he assumes in the teaching hospital. On the other hand, there are certain deficiencies in the small hospital that may end up in the fact that the resident's short period of training is diluted too far.

Summary

All of the specialty fields share some of the same problems, but pediatrics is in a slightly better position than many of the other fields, since there has not been as striking a shift in the service to private category. Where it has occurred, the judicious use of agency and private patients for teaching has been well accepted. There is a more fundamental shift in the types of illnesses in many of the referral type of teaching centers. However, an imaginative use of available extramural facilities can make up for any deficiencies in types of clinical material and, in addition, will give the residents valuable experience with patients more closely approaching the type of patients he will have in his own practice.

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PROBLEMS IN TRAINING IN OBSTETRICS AND GYNECOLOGY DUE TO CHANGING STATUS OF PATIENTS

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Physicians at the Congress on Medical Education and Licensure are bound together by a mutual concern for the quality of the medical care of the future. The educator is not unmindful of the hazards of today's operation or delivery nor of the need for good patient care today. But to that concern he adds a sense of responsibility—a feeling of moral obligation—for the increasing safety of the operations and deliveries of the future. He seeks to discharge this obligation by investigation and research which may contribute to the well-being of tomorrow's patients, by the teaching of tomorrow's physicians, and by the training of his own successors.

In this latter field, the area of postgraduate residency training, the greatest changes of the past 20 years have taken place.[1] The creation of the various boards of certification in the specialties and the formal approval of residencies and their public listing are steps which have had an impact on postgraduate education not unlike the impact of the Flexner reports on undergraduate education some 40 years ago. The quality of such postgraduate training has steadily improved, and, while eternal vigilance is required to maintain this improvement, the contrast with the old apprentice system (or lack of system) is unmistakable.

The discussions of this congress represent one aspect of such continuing vigilance; this panel has been assigned the task of considering thoughtfully the impact of the socioeconomic changes in the status of patients on the concept of good residency training as we know it today. The truth of the matter is that, as we have known it in recent years, the training of residents has largely rested on the presence in the communities of medically indigent people. To pretend that medical indigency is not disappearing or could never disappear is only to assume the ludicrous position of the ostrich. There is little use saying that a depression will reverse the trend toward increased health insurance coverage;

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

this is somewhat analogous to the military commander who assumes his flank can never be turned and hence makes no plans for such an eventuality.

In accordance with the implications of the topic, therefore, I would like to consider this situation on the assumption that the trends we see today are carried tomorrow to their extremes. Without pausing to debate whether these phenomena are likely to occur or at what rate or whether they are socially and medically desirable, let us think together on the basis of this triple assumption: 1. All patients *have some form of medical insurance.* 2. The spread of good hospital care peripherally in our larger cities and into our smaller communities continues. 3. The increasing size of our medical classes portends an increasing number of well-trained specialists.

Against a background of such enchanting premises, what are *the features unique to obstetrics and* gynecology which require special thought? Is the problem in all instances the same? Do we in obstetrics and gynecology face a common challenge *with medicine, surgery, and pediatrics? Fearful lest* my answer to these and to some of the other questions should become too personal, I have approached this by surveying eight medical centers in addition to my own. This survey was conducted with the agreement that specific figures and personal opinions would be held in confidence. Although in many details the chiefs of services were not all in agreement and while the centers were deliberately selected to tap varying local situations and backgrounds, nevertheless there is a surprising unanimity among them as to the potential seriousness of the problem. While I am grateful to these colleagues, it must be emphasized that they are not responsible for the ultimate content of my remarks.

Unique Aspects of the Problem in Obstetrics and Gynecology

Obstetrics and gynecology faces some unique aspects in this problem: 1. Since it is a surgical discipline, the phrase "increased use of private patients" is one of those pat solutions which are often glibly offered but are almost always completely meaningless. The essence of the surgical relationship during the training period lies in the transfer of responsibility to the resident. Unless the selection of the patient who is to be subjected to surgery is originally his, unless the postoperative management rests on him and also the responsibility of talking with the friends and family in the event of complications, unless, in short, the patient is "his" patient in the best sense of the word, then we will train a group of accomplished technicians who will have been ghosted to technical aptitude but we shall not have trained gynecologists.

2. Obstetrics and gynecology is a medical-surgical specialty in a way that general surgery is not. The general surgeon may resect a stomach for intractable ulcer when the internist asserts that all medical management has failed. With the intractably bleeding uterus, the gynecologist is his own internist, so to speak, and his medical half certifies to his surgical half that nonoperative therapy has failed and that surgical extirpation—the eternal confession of failure—must be resorted to.

This means that the medical center which has referred to it only those patients for whom medicinal therapy has failed and who require operation is not adequately supplied with problems for good obstetric and gynecologic training. The adage, "if it can't be cut, we won't take care of it," is not compatible with the care of the diseases peculiar to women, and the sterility problems, the endocrine disorders, the discharges, and the functional complaints would be missing from such a resident's experience. Properly practiced, gynecology usually requires between 50 and 70 patient visits to the office legitimately to produce one patient in the operating room. When one is one's own internist and when one is committed to the principle of the conservation of human reproductive potential, then the techniques of avoiding surgery must be taught as thoroughly as the techniques of performing surgery.

3. The decentralization of young couples is influencing the availability of patients in many teaching centers. Much of our clientele is young, and the young families are the ones principally moving to the peripheral areas.

4. There is, in most situations, little to be gained for a department of obstetrics and gynecology by an alliance with a Veteran's Administration hospital. As in the situation of pediatrics services, most of the government-controlled beds do little to supply our teaching needs.

5. The peculiar emotional reaction of patients and their families to pelvic problems and to gynecologic complaints also influences the patient situation. *Given a modicum of medical insurance coverage,* many families will still have the children's tonsils removed in the staff service and will have father's varicose veins fixed on the staff service but will use their modest coverage to assure private care for mother's "female trouble" and for the repair of her prolapse.

Suggested Solutions

Rather than consider a whole series of possible solutions to this problem merely to discard each one of them, let me mention only two which are frequently suggested and which embody two differing fundamental attitudes in the approach to this situation. In considering any such proposals, we are basically interested in the principles involved rather than the specific mechanical details, which may vary widely from location to location and from year to year.

Division of Residency Program into Two Portions.—It is often suggested that the residency programs be split into two portions, one part of the training period remaining centralized and the other part becoming peripheral in the hospitals of the surrounding communities. "Let the resident go where the patients are," runs the philosophy here. Since the large training centers have the facilities, as well as the men, to teach steroid chemistry, postoperative renal function and electrolyte balance, gross and microscopic pathology, and the many other imperative facets of resident education, let the first few years be spent in such centers, while for the bulk of his actual surgical experience the trainee would repair to smaller hospitals.

Superficially, this would seem to leave everyone reasonably happy, but it should immediately be pointed out that such a statement automatically implies that everyone is also reasonably unhappy. In essence, this scheme represents an attempt to mix the contemporary residency with the old preceptorship, and, while the preceptor system produced some highly colorful surgeons, it is irretrievably associated in our history with empiricism. To quote Ravdin,[2] "Under the preceptorial system the trainee performed a posterior gastroenterostomy for an intractable duodenal ulcer because his preceptor did this operation. . . . Those trained under the residency system had, in general, a more thorough appreciation of the physiological abnormalities imposed on the patient as a result of disease and were better able to care for certain of these abnormalities."

There is another added hazard: By the very location of their practices, by the nature of the way of life that they have chosen, the men designated under this proposal as the preceptors would be the very ones who had sought to avoid teaching associations or pedagogic responsibilities.

These contracts for divided training, where they have been formed, do not always result in happy bedfellows. The "Great Man" complex may creep on the unwary preceptor: "How can this fellow possibly practice unless he hears every word that I utter and does things just the way I do?" Rigidity replaces the spirit of free inquiry, and these alliances—like those with a possessive mistress—are alway easier to initiate than to break off.

Private Resident Clinics.—The proposal has frequently been made that we can solve much of this problem by the formation of private resident clinics. "Let the chief resident group become the responsible partners in a private-type clinic, with the visitants serving only as shadowy consultants" is the philosophy. The patients would have no misunderstanding as to who would be performing the operative procedure; fees would be collected for services by the clinic manager, and the full range of medical and surgical obstetrics and gynecology could be performed. In essence, teaching clinics would continue, under such a proposal, to accept the same patients they now serve; a change in standards of financial screening by the clinic would accompany increasing financial support of the patients. Women would be ruled acceptable for ward service who now are being turned away because in 1958 we cling to 1939's definition of medical indigency. In essence, the resident would be caring for the same group of women he is now caring for; this proposal simply upgrades the resident in the patient's eyes as she is financially upgraded by mass health insurance. I have no doubt that such a clinic would attract patients; indeed, if it did not it would behoove those teaching there to improve its attractiveness or to reduce the size of their residency staffs to be proportionate to the number of patients enrolled. We must not slice the operating experience too thin simply to get more personnel to render service.

This plan, proposed by many and attempted by some, immediately encounters three obstacles which will have to be reckoned with and cured prior to its successful application. First, the American Medical Association, acting through the agency of the local county medical societies, screams, "Unfair competition," and fights every step of the way. That it is competition is inherent in the very nature of the proposal; that an established practitioner should feel resident competition "unfair" speaks poorly for the quality of his own medical service.

Second, there are possible insurance problems. Many of the health insurance programs will not pay fees for operations performed by members of the resident staff. In view of the fact that in my city, as but a single example, these companies pay readily for the surgery performed by the full-time employees of the Cleveland Clinic, this is obviously a matter of semantics which will require us to reclassify our residents and to employ some term to which these companies are less allergic.

Third, tax problems are often cited. The resident is paid a standard (often a substandard) salary, in no way commensurate for the services he performs. Who pays the income tax on the total moneys collected? Once again, guided by the example of the many private clinics in the United States, I am confident this aspect is also susceptible to ready solution. Unfortunately, the reaction of the average physician to the tax bureau includes so much palmar perspiration that it often makes him oversensitive on this topic.

This type of solution to the increasing shift in the status of outpatient population has been presented often and more persuasively. It is here offered only as a thumbnail sketch, because, with each new proposal, the planner quite rightly alters the details. But if an approach of this general nature seemed to offer some hope, what positive steps would have to be taken?

In the first place, we must educate our county medical societies not to be eternally opposed to educational advances. In a period of frank anti-intellectualism, this will be no mean feat, but it remains true that the local representative units of the A. M. A. situated near the large teaching centers have consistently looked askance on many of the advances in postgraduate training. Much of this reeducation must stem from a new enlightenment within the parent organization itself, but the men in the trenches—the men actually carrying the burden of residency training—must also assume their share of this obligation. I join a distinguished colleague of mine who says, "One of the things that annoys me a great deal is that while we are training residents they want everything they can get their hands on, and, as soon as they get trained and out in practice, they soon accept the general philosophy of members of the county medical society in most of the areas and are reluctant to use any of their private or semiprivate patients for teaching material." We ourselves must instill in our resident group a devotion to the training of younger men which will survive contact with the current attitude of the practicing physicians. I would agree with Zollinger's statement: [3] "There is an urgent need for medical evangelists to rekindle a feeling of keen responsibility in the individual surgeon in every hospital in this country for the education of his eventual replacement. Certainly no one escapes the moral obligation of taking part in the education of his successors." As a positive gesture, therefore, let us make sure the rank and file of practitioners join in this effort to provide adequate training material for our future residents.

Second, medical insurance companies must be reeducated to recompense for the care rendered by the resident group. I live in a state which does not require an internship prior to practice. Therefore, a man who graduated from medical school last year and is practicing this year may collect from Blue Shield in Ohio for a hysterectomy, no matter how well indicated or how competently executed. On the other hand, a man with an internship, a year of training in general surgery, and three and a half years of thorough specialized training in obstetrics and gynecology cannot collect insurance for a hysterectomy because he bears the title, resident. The stupidity of this situation is so apparent it needs no further comment.

Finally, all laws introduced to provide for the health insurance of various segments of the population must include in their preambles the statement that any patient so covered automatically becomes teaching material. It is amazing that not one of the expensive lobbys which have opposed such legislation has ever stressed (or even mentioned) this point. In the current opposition to the Forand Bill, for example, no pressure is applied to include this stipulation in the obligatory health insurance of those eligible for social security benefits. Had those who have appeared in the past to testify against such legislation at congressional hearings ever mentioned this obvious prerequisite, their good faith and their genuine interest in medical training at all levels would—by such testimony—have received more than lip worship.

These, then, represent two forms of solution to the problem of the shifting status of patients in obstetrics and gynecology with relation to residency training programs: the approach of hopefully sending the residents where the patients are to be found, and the approach of altering our definition of "staff service" patients as the economic winds blow from a new direction. Before concluding, let me repeat that I have been reasoning from two premises: The first is that these changes will have an inevitable impact "on the concept of good residency training as we know it today." That changes could take place in ourselves and in our concept of good residency training must be recognized. We are not, I hope, personally immutable, but let us always guard against receding, against yielding to passing pressures by lowering our standards. If a new concept of residency training is to be formulated, we must examine it critically to insure that it represents an actual improvement in postgraduate education. The second premise was that these sociological changes had already been effected. This is, of course, a premise contrary to fact; they have not yet been effected, and presumably some time will be necessary for such a complete swing of the pendulum. This is fortunate, because it gives us the time to educate, the time to enlist allies, the time to prepare for the Brave New World.

Conclusions

No one of us possesses the final answer to this perplexing problem as to how we shall maintain our current standards of postgraduate training in the face of shifting socioeconomic trends. But though no one possesses the answer, all can benefit by this mutual discussion. For whatever the shape of the future, however uncertain it may appear, of one thing we can be sure: There will always be alert, intelligent young men asking for special postgraduate training; the form such training takes may alter significantly, but the demand will undoubtedly continue. And our obligation to these young men cannot be fulfilled by discussion alone; it must be fortified with positive and decisive action. The time available for reeducation and reorientation must be actively utilized. Our flank could be turned, and while such a change would be socially desirable, from the point of view of residency training we must be adequately prepared. We *must not* assume that the "status" will remain forever "quo." The position that the ostrich adopts is still ludicrous.

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The following chiefs of services participated in the survey: W. E. Brown, University of Arkansas Medical Center; M. E. Davis, the Chicago Lying-In Hospital; R. R. deAlvarez, University of Washington School of Medicine; R. G. Douglas, the New York Lying-In Hospital; F. R. Lock, Bowman-Gray School of Medicine; C. E. McClennan, Stanford University School of Medicine; E. W. Page and E. W. Overstreet, University of California Medical Center; and J. R. Wilson, Temple University School of Medicine.

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COMMUNITY HOSPITAL AND GRADUATE EDUCATION TODAY

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The term "community hospital" has been used in most instances to indicate a hospital which serves a given center of population. The great majority of such hospitals are in small or medium-sized communities in which no medical school is located. For this reason, the word "community" has often been used instead of "non-university–affiliated" or "nonteaching" in describing the work of such a hospital, since it is much more convenient than "non-university–affiliated" and, to most of the staff of a large proportion of such hospitals, occupied as they are in the education of interns and residents, the term "nonteaching" is somewhat offensive. For these reasons, the words "community hospital" will be employed in this communication to mean a hospital which does not receive medical undergraduates for regular clinical instruction nor have any direct ties with medical schools. Many of them, of course, are privileged to have physicians from the faculties of nearby medical schools as occasional or even regular speakers at meetings and conferences.

With the technical advances in diagnosis and treatment that have taken place in recent decades, the practice of medicine in the United States has, of necessity, become primarily hospital practice. If we wish to judge its quality, we must examine medicine as practiced in community hospitals. This is because it is to community hospitals that most Americans go when they are sick. Table 1 illustrates this fact. It indicates that throughout the United States there are almost four times as many beds in community hospitals as in hospitals affiliated with medical schools (the so-called major and minor teaching hospitals). Approximately half are in hospitals engaged in the training of interns. In the New England states, the ratio of beds in these hospitals to beds in the university–affiliated group is even higher. In this area, only slightly more than one patient in five is cared for at a hospital with university affiliation.

In order to be able to make and report a rather detailed study of community hospitals and because of an intimate acquaintance with these hospitals in the New England area, we decided to confine this study to this region, which, it can be assumed, is fairly typical of the country in general.

Organization of the Community Hospital

As is shown in table 2, there are almost four times as many hospital beds in community as in so-called teaching hospitals of the major and minor variety. Of these community hospitals, slightly more than half the beds are in the 53 hospitals that support approved intern-training programs. In order to evaluate the educational facilities that are presented to the interns in these hospitals, we have received from all the 53 hospitals detailed descriptions of their educational programs and have personally visited almost all of them. This study was begun a year and a half ago, and during that time a number of the hospitals have expanded and improved their programs. As of August, 1957, the situation is as follows:

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

Eight of these hospitals employ full-time directors of medical education. In addition, there are two full-time directors who serve more than one hospital in this capacity. In 25 hospitals, the director of medical education is on part-time duty (this includes the two mentioned who divide their services between two or more hospitals). In 20 hospitals, the house-staff training is under the supervision of intern education committees.

TABLE 1.—*Hospitals in the United States in Relation to Internships and Medical School Affiliation*

	Hospitals	
	No	Beds
Approved*	2,645	479,668
Unapproved	2,654	106,830
Total	5,299	586,498
With internships		
Medical school affiliation	200	104,291
No medical school affiliation	600	173,215
Without approved internships	4,499	202,162

* Joint Commission on Accreditation of Hospitals

In all of the 53 hospitals, bedside teaching by the attending staff on regular rounds is stressed as the most important part of the program Fifty have special teaching rounds in addition. Bedside or case teaching, of course, is the most important part of the educational program of a hospital. We will all agree that it is at the bedside in intimate discussion with the attending physician that the intern really learns medicine. Some community hospitals have gone so far as to omit didactic lectures, but most directors of medical education believe that these are useful because, besides being of some value to the house staff, they serve to keep the attending staff interested in the program and in preparation for their presentations they must keep up their own studies. Clinical conferences, however, in which the house staff takes an active part, are certainly of much greater value than lectures which, like medical movies, represent the type of spoon-feeding requiring no effort on the part of the hearer, which leaves but little permanent impression.

Pathology and clinical pathology are taught at regular conferences in 48 hospitals, and in a large proportion of these the intern serves a term in the laboratory, where he learns the technique and significance of the most important tests, as well as assisting at postmortem examinations. In 51—all but two—the radiologist holds regular teaching conferences for the house staff, in addition to giving practical instruction on the films that are taken in the course of the care of ward and private patients. In all but one of the hospitals, regular clinicopathological conferences are held. Interns take an active and responsible part in all conferences in all the hospitals. Fifty of the hospitals invite distinguished speakers to address their staffs at regular intervals. Thirty-six have journal clubs, and 39 have some type of affiliation with other institutions, many of these being university hospitals, to enhance the value of the experience offered to their interns. Twenty-six of the hospitals also had approved residency training in one or more specialties as of the summer of 1957, and probably the number has been increased.

From this, it can be seen that a real and effective effort is made in all the community hospitals of New England to give interns good professional training. It is, of course, easy to say that a hospital can have a good program on paper which it does not really carry out. This is true, but there is no doubt in our minds that in almost all of the hospitals that we have visited the program on paper is a program in fact, and in hospitals that we have not visited we have every reason to believe by our knowledge of individuals in close touch with these hospitals that a similar situation exists.

The Internship

As was pointed out two years ago by Stone,[1] it may be added that in the community hospital the intern comes into more intimate contact with patient's families and, under supervision, has a higher degree of personal responsibility for patient care than is the case when he works at the bottom of a hierarchy of assistant, junior, and senior residents, assistant, junior, and senior attendings, a professor or two at the top, and any number of intercurrent clinical and laboratory investigators. Omission of the internship as a general improvement in graduate training had previously been suggested by Leveroos [2] on the ground that the intern, between the clinical clerks below him and the residents above, holds an unenviable position in which his responsibilities and training are not always too valuable. In the little journal entitled *Resident Physician* we find this statement, with which we are inclined to agree: "In spite of the fact that increasing responsibility is given to the house officer as he ascends through the ranks of intern, assistant resident, resident, and senior resident, the supervision is so great that at times it even tends to squelch initiative and self-confidence." As Stone

TABLE 2.—*Hospitals in New England in Relation to Internships and to Size and Affiliation*

	Medical School Affiliation		No Medical School Affiliation		Total	
	No	Beds	No	Beds	No	Beds
With internships	15	6,449	53*	14,430		
Beds, no						
100-199 ...			19	3,163		
200-299			18	4,459		
300-499			12	4,342		
500+			4	2,466		
Without internships	18	2,441	211	15,223		
Totals	33	8,890	264	20,673	297	29,563

* Total is 54 as of Jan 1, 1958

emphasized, these essential qualities can be developed and an intimate personal acquaintance with sick people obtained in the community hospital internship. This should tend to make the young physician a better doctor and give him perspective and understanding which will serve him in good stead if and when he goes on to specialty training in a residency. In the community hospital, then, he learns to see the patient as a sick human being who is definitely dependent on his skill and judgment, not merely as an interesting and instructive problem in abnormal physiology or biochemistry.

It seems somewhat paradoxical that, with more than 75% of patients in the United States being cared for by nonuniversity hospitals, these hospitals have decreasing numbers of American medical school graduates as interns and residents, while each year finds increasing numbers of medical school graduates remaining under the maternal wing of the university hospital of their own or another medical school.

It has been admitted by some medical school faculty members who also are chiefs of their respective services in university hospitals that they have increased their quotas of interns, so that if they fail to secure a maximum number they may continue unhampered because they still secure an adequate number of interns. Those of us who spend a considerable amount of time in university as well as nonuniversity hospitals feel that most university hospitals are overstaffed and most nonuniversity hospitals are understaffed.

A frequently suggested remedy for the above situation is that all nonuniversity hospitals worthy of a house staff should be affiliated with medical school centers on a clinical clerkship, internship, or resident training basis. It is admitted by most medical schools that this would be impracticable or even impossible, because medical school faculties in general are already understaffed and overworked without this additional responsibility.

Where, then, can we find reasonable agreement and a workable solution? We would suggest that medical schools search out for their interested graduates those rotating internships in nonuniversity hospitals where a well-trained, unselfish, and devoted group of clinicians are willing to spend time and effort in the teaching and supervision of the young graduate. Such information is readily available through the office of the Council on Medical Education and Hospitals of the American Medical Association and is kept up to date by frequent inspection of the programs of all hospitals that expect to retain such approval. It should be recognized by all concerned with the above that no system will work effectively unless all groups participating in these phases of medical education are dedicated to the principle of constant improvement of medical training. The medical school could and should assume the role of guiding toward such rotating internships at least those students who wish to prepare for the general practice of medicine. We can say also, without reservations, that most practicing specialties will provide better patient care if they also have had the broadened perspective which comes with a good rotating internship.

At the present time, few medical schools give their third or fourth year students any glimpse of general practice with carefully selected general practitioners on the medical school faculty or an approach to rural medicine by way of the preceptorship. Having had no contact as a medical student with the above, it is obvious that very few medical students will choose this type of practice, not realizing the joys the rural physician may find in being a citizen as well as a physician in the lesser populated and perhaps more widely scattered areas where the greatest need for practitioners exists today.

It is our opinion that any medical school graduate who expects to see and treat patients certainly could benefit by a rotating internship. This is statistically supported by the findings of the study of the Advisory Committee on Internships [3] wherein (of those answering a questionnaire covering the graduates of medical schools in the United States in 1937 and 1947) 91.6% of the 1937 graduates having had rotating internships would still choose such an internship and 93.5% of the 1947 graduates having had rotating internships would still choose such an internship, while almost 50% of those having had straight internships would, in retrospect, have chosen rotating internships. This opinion, it will be noted, came from both a pre-World War II and a post-World War II graduating class. It, however, should be admitted that to force medical graduates completely into any one type of internship (be it straight or rotating) would create a serious schism between medical schools and organized medicine. For those medical graduates who expect to spend their lives purely in the research laboratory or who perhaps hope to become "full-time" in academic medicine, there is a place for the straight internship. For the great majority of medical graduates who wish to practice medicine, however, the rotating internship offers an invaluable opportunity to broaden perspective and even to assist in a subsequent choice of specialty.

Internships in community hospitals are all of the rotating type. As has been indicated, it is in community hospitals that the greater part of medicine in the United States is practiced. Half of the beds of these hospitals are in institutions that support approved intern training. But only with a group of interns on the job can the community hospital do its best work for its patients. In other words, service is balanced with training in the ideal situation. Where the intern and resident are led to believe that the hospital is primarily, not secondarily, an institution to give them an educational experience, the whole philosophy of medicine breaks down. Such a conception does not produce the best type of physician, and the ideal is certainly a lower one than that in which the intern at all times is made to feel that good patient care is always the primary objective. When we hear, as we have, in a good so-called teaching hospital the resident say, "I didn't admit him, for his problem didn't seem very interesting," we shudder!

Alert, eager, and industrious interns not only furnish better care to the patients but provide a constant stimulus to the attending staffs, who, in teaching them, of course teach themselves and thus, of necessity, improve their own work. If we can say, then, that a house staff is necessary to produce the best of patient care in a hospital, let us ask where the smaller community hospitals obtain their interns. We all know that there are 4,000 or 5,000 more approved internships in the United States than there are American and Canadian trained graduates available each year to fill them. The answer, of course, is that the hospitals employ graduates of foreign medical schools. Most community hospitals have received few interns through the matching program (table 3), and, in the smaller hospitals of this group, well over 90% of the internships must be filled by foreign graduates or remain empty.

It has been stated from the "ivory towers" of medicine that many such hospitals, in employing these physicians as interns, exploit them by utilizing their services, giving them no real training in return, and thus turn them out to be licensed and to fall into a group of second-rate practitioners who are a menace to the American public. While this may be true in rare instances, particularly in hospitals which employ such physicians as paid house officers and not in approved internships, the material that has been presented makes it clear that definite progress is being made in building up adequate intern training experiences in practically all the community hospitals of New England in which there are internships that have been evaluated and approved by the Council on Medical Education and Hospitals. We have no reason to suppose that the situation in the New England states is different from that elsewhere in the country.

It is true that many poorly trained foreign physicians apply for internships in the United States. Hospitals have had to evaluate candidates for appointment with great care. Many of them, however, have developed effective techniques and make but few errors. The situation will be greatly improved when the screening examinations developed by the Educational Council for Foreign Graduates have been put into effect. This will indeed be a step forward. In the meantime, it is of interest to recognize that a number of well-qualified physicians have been arriving and enrolling for the rotating internship that is a necessary first step for most of them. There are also a number of physicians who come to this country on exchange or student visas, and most of these will return to their homelands. One can mention here the work of the Ventnor Foundation, administered by Dr. and Mrs. Hilton Read, of Atlantic City, N. J., under which selected graduates of German universities are brought to America for a year's internship in community hospitals and the similar program of the Unitarian Service Committee, which brings in young French physicians. There is also a large group of Hungarian refugee doctors, some being highly qualified specialists, who are serving in routine rotating internships at the present time. In one small community hospital, the intern staff includes a pathologist of eight years' experience, an orthopedic surgeon with an equally long training in his field, a radiologist with seven years of work in his specialty, a surgeon who has served four years as surgical registrar in British hospitals, an Argentine practitioner with three years in general practice, a recent Harvard fellow in cardiology, who is a graduate of the University of Milan, and a graduate of Athens University with three years of pediatric training (two of them in the United States). In another community hospital, the intern staff is 100% British-trained and compares favorably in every way with a similar group of American-trained individuals. Not every hospital has had as good fortune in choosing its house staff, but it is clear that, with careful selection, an acceptable group can be secured by most of them from the many applications which are received.

TABLE 3.—*Results of Matching Plan in Community Hospitals of 100-200 Bed Capacity*

	Interns		
		Matched	
	Sought	No.	%
1955	89	6	6.7
1956	93	4	4.4
1957	91	11	10.0
Totals	278	21	7.5

Residency Training

It is not our intention to deal at any length with residency training in community hospitals. We are of the opinion that residencies in general practice in which the resident can go on to a two-year rotating training in which he receives a high degree of responsibility for patient care and can achieve real competence in various fields of practice are best developed in carefully selected community hospitals. Residencies in the specialties, we feel, can also be maintained on an educational level equivalent to that of the university hospitals in some of the larger community hospitals. In the smaller institutions of this group, there are occasionally departments, such as anesthesiology or pathology, which can offer an excellent experience to the resident, and, as was recently pointed out by one of us,[4] smaller hospitals can combine to offer good training in one of the major fields, if their work is carried on under central supervision. Such a combined three-year medical residency in three community hospitals in New England has been approved by the Residency Review Committee in Internal Medicine and is now in operation in Rhode Island. It is also our opinion that all residency training in community hospitals should be carefully and frequently evaluated by the authorities, as in certain instances we believe it is below standard. Where university supervision is possible or rotation of residents from well-established hospital programs can be arranged, this is certainly desirable. We are also of the opinion that residencies should not be established without the coexistence of internships, for, under these circumstances, the residents carry the routine duties of interns and lose the opportunities for special study and training which they should have.

Comment

Community hospitals which deal with acute disease carry most of the patient load in the United States, and half of their beds are in hospitals which support approved internships. In this way, these hospitals are developing educational programs of real merit, which they are constantly improving. These hospitals are forced to fill their positions to a great extent with foreign graduates, many of whom are highly qualified. When the new screening examinations for foreign-trained physicians entering the United States are in operation, the problem will be greatly simplified and the hospitals protected from mistakes in the appointment of physicians, which at present are occasionally inevitable.

As the situation now stands, it seems clear that university authorities should take a more active part in the situation than they do. True, certain of them have made definite moves in this direction. The work of New York University, the University of Rochester in its relation to the Rochester Regional Hospital Council, and several others could be cited. To what extent these moves will prove of practical value remains to be seen. University affiliation in name only is not of much help, and we are aware of at least one excellent community hospital whose program has been much better now that the quite inadequate "affiliation" with a great university has been discontinued. It would seem however, that a plan by which an American student, particularly one intending to do general practice, could be encouraged to go to a community hospital for an internship in which a university is willing to take some responsibility would result in better training for the individual and better medicine in the hospitals involved. If this were extended, as proposed by Stone,[1] to the point of limiting internships to community hospitals and residencies, for the most part, to university hospitals and certain larger community institutions, we believe, as does he, that the end result would be better medicine, both by general practitioners and by specialists.

Summary

The community (non-university-affiliated) hospitals care for more than three-quarters of patients hospitalized for acute disease and injury in the United States. Approximately half of the hospital beds in community hospitals are in institutions which support Council-approved internships.

A study of the 53 hospitals in New England which fall into this category shows that they all are constantly improving these programs. Eight have full-time and 21 have part-time directors of medical education. In order to fill their quotas, these hospitals have to appoint a large number of foreign-trained physicians. In the smaller ones (of 100 to 200 bed capacity) this approximates 95%. Many well-trained foreign graduates are available, but the selection is difficult and the establishment of the examination by the Educational Council for Foreign Graduates will afford needed help and protection to these hospitals.

Because of the advantages to the intern of the training opportunities in community hospitals, a greater interest in these hospitals is recommended to medical school authorities. An internship in one of these hospitals offers the best training for general practice and an ideal background for the physician who intends to embark on a residency in one of the specialties. University authorities would be well advised to recommend such training to a large percentage of their graduates.

164 Summit Ave. (Dr. Burgess).

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POSTGRADUATE SURGICAL TRAINING AND THE CHANGING ECONOMIC STATUS OF PATIENTS

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Surgery is the first of the branches of medicine to be severely hampered in its graduate teaching by the changing economic status of patients. Halsted introduced to the United States the present type of residency training, which is modified from the German system. This type of training, now adopted by most other branches of medicine, provides gradually increasing experience and responsibility until the final year, when complete or nearly complete responsibility is given to the resident. Surgery is the first specialty to be seriously affected, because voluntary surgical fee insurance is the most popular type of medical fee insurance today. Thus, surgery, the most popular type of graduate medical training, is the first specialty to have its graduate medical training affected by the changing economic status of patients. It is also obvious that, when in the future there is complete or nearly complete coverage of all individuals by professional fee insurance, surgery also will be the most seriously affected in its training program.

Placing of Responsibility

In medicine, pediatrics, and many other medical specialties, responsibility to a large degree can be given to an intern or resident. This can be done without seriously jeopardizing the attending physician's ethical, moral, and legal responsibilities to the patient. This is not so in surgery. In most of these medical specialties the results of therapy hinge primarily neither on what happens in a certain period of minutes to several hours nor on the technical skill of one individual. The operative part of surgery is only a relatively small part, but no one will deny that it is important. That direct operative experience is most important in any acceptable surgical training program has been recognized by the American Board of Surgery by its refusal to continue to give complete credit for work done by residents in those institutions which do not provide progressive operative experience and responsibility for their residents. On these points in a surgical program, (1) the rapid disappearance of the ward service patient, and (2) the inability to use private patients, hinge various ethical, moral, and economic problems.

For those who would say that these problems are not for those in the smaller community hospitals but are for those in the major and minor medical teaching hospitals, I would remind you that since 1956 there have been more students of medicine in internships and residencies than there have been in the medical schools. This means that one in seven physicians in the United States today is taking medical postgraduate training—and the number is increasing, not decreasing. The medical schools and their associated teaching hospitals can take care of only a proportion of this postgraduate training program. These postgraduate students of medicine, the interns and residents, are looking for the best possible training, the best graduated intern and residency experience that they can get. A number of smaller hospitals recently have hired full-time or part-time educational directors, and some have established research facilities, including animal quarters, to help meet some of the residents' demands for a full, rounded training. As has been pointed out many times, such an educational program also improves patient care. This is not a medical school problem alone. This is a problem for every hospital that hopes to have a good intern and resident program. One of the important questions today is, "Who pays for this additional program?" With the development of the insurance programs, the private patient no longer helps in a major way to support the total effort of the hospital as he did a few years ago. Who does now or who will in the next few years pay for this expense of the hospital? Will it be the rapidly disappearing large donations, the many friends of the hospital, the attending doctors, the Community Chest, the insurance companies, the federal government, or each individual consumer of medical care?

As each hospital attempts to solve its immediate problems of today, it meets many frustrations. As I see it, the medical profession has no one but itself to blame for these current economic problems. Every insurance group has consulted with doctors before embarking on a health insurance program. Have we given them a true picture of the situation? Did we know then what the situation would be like today? And, more important, do we know exactly what the situation is today?

Many county and state medical societies and insurance companies, Blue Shield programs as well as state laws, take the stand that the individual who *signs the insurance forms for the surgical fees* indicates by his signature on the form not only that he was responsible for the patient but that, in addition, he performed the operation. It becomes quite evident that the senior resident cannot morally and ethically sign these forms for a patient on whom a qualified assistant resident operated. Also, an attending surgeon cannot do this for any of the ward-service patients operated on by any of the residents, even in his presence or with his assistance.

Finally, an attending surgeon cannot—or, in a strict sense should not—sign such an insurance form for his own private patient who was operated on by

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Read before the 54th Annual Congress on Medical Education and Licensure, Chicago, Feb. 10, 1958.

a resident with the attending surgeon acting as the first assistant. Also, when a resident does an operation on a private patient of an attending surgeon without the patient's knowledge, the question of ghost surgery is raised, regardless of whether the attending surgeon was present.

Reasons for and Outmoding of Regulations

Some of the rules and regulations of some local, state, and national societies and associations adopted by many insurance companies and made into law in some areas, which were very sound and natural developments, have under the present situation become seemingly incongruous. I shall mention only two of the factors that played some part in the development of these rules, regulations, and laws which we now find unintentionally restricting.

Unhappily, both of these factors that I mention are distasteful. The first factor developed because of the unscrupulous practices of some of our colleagues in the medical profession, namely, the individual who collected for his own pocket the insurance fees for patients whom the residents treated and possibly operated on and, occasionally, for a patient whom the collecting physician never saw. That this is wrong needs no further amplification. The second factor developed from the attitude of some physicians, first, that the cost of medical research and teaching is no concern of theirs or of their patients and, second, that every dollar that they can gather into their own pockets is very definitely the concern of the individual doctor.

Those doctors who express or give the impression of the attitude that they have completed their medical training, are in private practice, and, therefore, have no concern for the welfare patient, with medical research, or with training, are not true members of the profession in the light of the oath of Hippocrates. They also ignore the estimate by Gregg that probably 90% of their patients are alive today, rather than 10%, as a direct result of medical research. Furthermore, they do not realize that medical research is now in its infancy.

For those who believe that every available patient dollar should go to the individual practicing, non-research-minded, nonteaching doctor and that not a single one of these dollars should go to research and teaching, I believe that information provided by Dr. William Grose is pertinent. In the state of Maryland there are 2,200 doctors. The sum of $128,000 was earned in one year by the two medical school hospitals in that state by reason of the treatment they did render to patients. Even if this total sum were divided, it would amount only to $58.65 for each doctor in the state of Maryland. He further points out that this is not potential money taken out of the pockets of the individual doctors but that it represents available money that came through a third party, or insurance, from a class of patients who previously contributed nothing toward the cost of their care. Years ago, when the ward-service patients could pay nothing, there was no argument about the fact that the teaching hospitals could take care of these indigent, ward-service patients. The same is true now of those areas where there are many indigent, ward-service patients. Again there is no argument about who cares for these patients.

Government Subsidy

A very good question, to my way of thinking, is this: Would the American people who were so eager to pay their own way by purchasing voluntary hospital and professional fee insurance from individual companies and groups, rather than sit back and demand socialized medicine, also be eager to individually help foot the bills of research, development, and teaching, rather than to depend in the future almost entirely on government subsidy? I do not believe it is the intention of the federal government to provide all or nearly all of these costs. It is, of course, quite proper and indeed a necessity that the federal government, to a large extent, subsidize medical research and teaching, but should it provide the major portion, nearly all, or all of this subsidy? At the present time, the federal government provides directly or indirectly 50% of the costs of research and development of medical schools in the United States. Recently, I heard that in one school this amounted to almost 100% of their cost of research and development. Those of us who have received some subsidy from the federal government are grateful for this assistance and will continue to look forward to continued support from this source in the future—and, of course, others should do likewise.

What is being done to meet these problems? Of course, those residency programs which are most seriously affected by a lowered number or a complete lack of ward-service patients are the ones most interested at the moment. It would appear that in certain areas in the Midwest and in the South there is no serious problem. Where the shoe pinches there is much interest and activity, where the shoe is tight there is interest and a little activity, and where the shoe fits well there is neither interest nor activity.

Adequate Surgical Training

Through discussions and correspondence with many surgeons throughout the country, it appears to me that established surgeons are very much determined to give adequate surgical training to young men. Apparently, their determination to train young surgeons is so great that they are training them without regard for some of the rules, regulations, and laws that we now find incongruous. This training includes not only graduated experience in the over-all management of surgical patients but also, very definitely, graduated operative experience extending over several years. Note that I did not say the last year of residency; you cannot teach a young surgeon to operate in one year.

I think it would be fair to assume that, of the major and minor medical school hospitals and also a large number of hospitals not affiliated with medical schools, one in three has a problem in regard to a sufficient number of ward-service patients for adequate surgical residency training. Probably an additional 1 in 10 has an extremely serious problem in this regard. It would appear that the nonmedical school hospitals are just as concerned about their shortage as are the medical school hospitals.

Dr. I. S. Ravdin has suggested that the need for patients for surgical training can be satisfied by military and Veterans Administration hospitals, which are frequently filled with patients who do not have service-connected disabilities. He points out that this will make it possible, without any lowering of standards, to train more young men in general surgery while also providing the experience of general surgery that is essential for the training of the surgical specialist. Certainly a closer relationship between civilian, military, and VA hospitals will help solve the problem of patient shortage.

To what extent are private and semiprivate patients being utilized for surgical residency training in lieu of ward-service patients? I would not be at all surprised if one or more attending surgeons in 50% of the hospitals in this country occasionally, if not regularly, do allow competent residents to operate on some of their private patients. This does not mean that all surgeons are doing this, but very definitely it is being done all over the country. I am sure that in most instances the attending surgeon is assisting the resident at the operation and, therefore, is available to give advice and is able to complete the operation if necessary. We would all agree that he should protect the best interests of the patient and, of course, of himself. In an even larger proportion of hospitals, the surgical resident is often allowed to open and close the wound as part of his operative surgical training. Those attending surgeons who do allow residents to operate on the attending surgeon's semiprivate and private patients should know of a relatively recent statement approved by the Board of Regents of the American College of Surgeons. This statement reads as follows:

> Since the informed consent is a moral and legal prerequisite to the performance of a surgical operation, every patient about to undergo surgical operation, or his legal guardian, should have full and complete knowledge of the identity of his surgeon. Only from strict observance of this principle can the surgeon meet his obligation to this patient, whether the patient be private or not. Such conduct is essential to sound surgical training. Private patients can be used honorably and effectively for residency training only when the patient is fully aware of the extent of the resident's responsibility for his care and his degree thereto.
>
> The operation itself is only a part of the care of surgical patients, and this should not be overemphasized in the training of residents. It is equally important for residents to become familiar with sound principles of preoperative and postoperative care, the application of the basic sciences to surgical problems, and the use of suitable methods of diagnosis. Furthermore, the satisfactions of the patient-physician relationship are rightfully a part of the resident's experience and serve to develop the moral and ethical standards on which the art is based.

Several institutions have established the senior resident as a junior attending staff member, who, therefore, is entitled to have his own private patients while he is still in the residency training program. Such individuals usually have contracts with the hospital or service which indicate that the fees of their patients are retained by or turned over to the service, the department, or the hospital for enhancement of the surgical teaching and research programs.

Professional Fees

In many hospitals, the surgeons and administrators feel that because of existing laws, rules, and regulations they cannot collect any of the professional fees. In those hospitals where fees are collected, either the physician collects these fees or the residents collect them. In most instances the income is reported on an individual basis and then is written off as a charitable contribution to the service, department, hospital, or special research development fund.

In some areas the local income tax people do not require that these moneys appear as income on an individual's income tax return. One hospital has gone so far as to obtain clearance from the Department of Internal Revenue in Washington which allows these funds to be omitted from the individual's income tax return provided he has signed an agreement on file with the Department of Internal Revenue.

It is interesting to know that some hospitals take the professional fee to pay part of the costs of hospitalization when the hospitalization insurance does not cover the complete cost of hospitalization. Any remaining excess of professional fee is either returned to or retained by the insurance company or plan, deposited in the surgical department, or deposited in a hospital or medical school fund to further the ends of research and teaching. Why should the residual professional fee, under some laws, necessarily be returned to or be retained by the insurance company or professional insurance plan? Why should any hospital be allowed to take part of the professional fee to pay patients' hospitalization costs and yet not be able to use the remainder of the professional fee to support research and teaching efforts of the professional staff?

Conclusions

It is apparent that our changing economic order in respect to voluntary and involuntary health insurance has produced many annoying growing pains. Because we are discussing an economic change, the ugly subject of money has been aired. I have emphasized that, in the future, in an order in which nearly everyone is completely covered by professional fee insurance, surgery, by the very nature of its important therapeutic tool, the scalpel, suffers the most under present rules, regulations, and laws. Also, surgery is the first to feel the full impact of the increasing rate of coverage by professional insurance.

It is at the same time apparent that we will train young surgeons for the future as we have in the past. It may not be by the system that we know as the Halsted system of residency training. Whether these future surgeons will receive part of their training on ward-service patients who pay their hospitalization and professional services by means of insurance or whether the surgical trainees receive this small but important part of their training entirely from semiprivate or private patients is up to the decision of the medical profession.

If we, as a professional group, cannot agree on a clear road for the future, the decisions will be made by other interested groups or by other forces. In the words of John R. Paine, "The private patient must be redefined, and medical ethics and morals must be revised. The sooner the medical profession in particular, and the public at large, realize this fact, the better off everyone will be. If this is not the case, the system of surgical training as we know it, based on the graduated residency, is going to collapse from a lack of ward-service patients."

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CLINICAL NOTES

NEPHROSIS OCCURRING DURING TOLBUTAMIDE ADMINISTRATION

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and
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In view of the great popularity and increasing use of orally given hypoglycemic sulfonamides, the occurrence of the following case of nephrosis which was seen by one of us (C. S.) during the administration of tolbutamide (Orinase), the first such case to be noted, is of interest.

Report of a Case

A 41-year-old woman had an appendectomy in 1936 and a cholecystectomy in 1950. Otherwise, she had been generally in good health during the last 10 years while under the care of one of us (C. S.). In March, 1957, a vaginal hysterectomy was performed for removal of uterine fibroids associated with menorrhagia and metrorrhagia. During this hospitalization, she was found to have mild diabetes, and her condition was standardized on therapy with 10 units of NPH insulin and a 1,200-calorie diet, given from March, 1957, until July 1, 1957. During this time she received no other medication and suffered no other illnesses. On July 1, 1957, she was started on tolbutamide therapy, 6 tablets the first day, 4 the second day, and 2 daily thereafter. Insulin was withdrawn at this time. Tolbutamide was the only medicament given until the onset of her present illness on Sept. 9, 1957. Initially, blood sugar level determinations, urine examinations, and white blood cell counts and differential counts were done at weekly intervals, then at biweekly intervals. She suffered no infections or other illnesses from July 1 to Sept. 9, 1957.

On that date, two weeks after her last examination, the patient complained of headache, nausea, vomiting, dizzyness, marked puffiness of the face, and inability to pass urine. She was hospitalized at the Misericordia Hospital, Philadelphia, on Sept. 10, 1957. On admission, her temperature was 98 F (36.6 C), pulse rate 70 per minute, and blood pressure 102/60 mm. Hg. Her face was markedly edematous, and there was some presacral edema. The patient was extremely nauseous and irritable; she developed twitchings and was somewhat irrational. While in the hospital, she had marked oliguria for several days. She was maintained on intravenously given fluids, with careful attention being given to the electrolyte and acid-base balance. On Sept. 13, 1957, diuresis began. Marked improvement ensued, and the patient was discharged on Sept. 21, 1957, free from symptoms. During her hospital stay, her temperature, pulse, and respiration rates and blood pressure varied little and were normal at the time of discharge.

Laboratory Studies.—Results of urinalyses are given in the table. Blood urea nitrogen levels Sept. 10-13 were 40, 60, 40, and 25 mg. per 100 cc. respectively; on Sept. 16, the level was 19 mg. per 100 cc.

A complete blood cell count on Sept. 11 was normal. The serum carbon dioxide content on Sept. 10 was 20 vol. %. The serum chloride level on Sept. 10 was 92 mEq. and on Sept. 16, 107 mEq. per liter. The total serum protein level on Sept. 10 was 5.34 Gm. per 100 cc. (albumin, 3.87 Gm. per 100 cc., globulin, 1.47 Gm. per 100 cc.). The serum sodium level on Sept. 11 was 136 mEq. and on Sept. 16, 125 mEq. per liter. A phenolsulfonphthalein test done on Sept. 18 showed 11.6% excretion the first 15 minutes and 8.1% the second 15 minutes (total, 19.7% excreted at the end of 30 minutes). On Sept. 11 the total serum cholesterol level was 308 mg. per 100 cc., with esters 150 mg. per 100 cc.

Dr. James L. McCabe, medical chief at the Misericordia Hospital, stated in consultation, "This patient has an acute toxic nephrosis, most likely due to tolbutamide." When last seen on Jan. 2, 1958, the patient was asymptomatic and her blood urea nitrogen level, urinalysis, and blood pressure were completely normal.

*Urinalyses of Patient with Acute Nephrosis During Tolbutamide Administration**

Date	Sp. Gr.	Alb.	Bacteria	RBC	WBC	Epithelial Cells	Crystals	Casts	Output, Cc.
9-10									200
9-11	1.005	4+	few	2-3	82	mod.	none	occ.	400
9-12	1.004	4+	few	2-3	10		none		500
9-13	1.001	3+		few				occ.	1,250
9-14	1.001	2+		occ.	3-7				2,200
9-15	1.001	2+		few					4,270
9-16	1.001	1+		few	occ.		none	occ.	3,175
9-17	1.002	trace		few					3,750
9-18	1.002	trace		occ.	3-10				3,025
9-19	1.002	trace		occ.					2,550
9-20	1.004	trace		few					

* Color consistently yellow, reaction acid. Tests for sugar and benzidine were negative throughout.

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Comment

This patient had an acute nephrosis. She had been given no drugs other than tolbutamide and suffered no infections prior to her illness. To date, there have been no reports of renal complications after the use of tolbutamide.[1] In this case, the cause of the renal complication cannot be determined conclusively. However, the relationship of the nephrosis to tolbutamide use may be presumptive.

Summary

A woman with mild diabetes whose disease was of recent origin had been on tolbutamide therapy for two months when she developed an acute nephrotic syndrome. The patient recovered immediately on withdrawal of the drug. This suggests that there may be a presumptive relationship between tolbutamide and renal complications.

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RAPID DIGITALIZATION OF AMBULATORY PATIENTS WITH ATRIAL FIBRILLATION

USE OF INTRAMUSCULARLY GIVEN DESLANOSIDE FOLLOWED BY ORALLY GIVEN ACETYLDIGITOXIN

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This study was undertaken in an effort to establish a safe method of rapidly digitalizing ambulatory patients, preferably in one clinic visit, by means of the combined administration of a parenterally and an orally given digitalis preparation and also to evaluate the feasibility of the intramuscular route of administration of deslanoside (desacetyllanatoside C, lanatoside D). It was prompted by the necessity of treating a large number of patients in an active cardiac clinic where available personnel was minimal and patient attendance irregular.

Material and Methods

In order to provide a means of measuring the effect of the drugs, selection was limited to patients with atrial fibrillation. The study includes 16 patients, 3 of whom received two trials with deslanoside. All patients had well-documented heart disease. Each was observed for a period of four weeks before the study was begun, during which time no digitalis preparations of any kind were used. The dose of deslanoside was 1.6 mg. in 16 trials and 1.2 mg. in 3 trials. In all cases this was given in one dose in a single injection intramuscularly in one buttock. The initial effect of the drug was taken as the time necessary for a 10% reduction of the control ventricular rate. When this occurred, maintenance therapy was begun with acetyldigitoxin in doses of 0.1 to 0.2 mg. (Maintenance therapy was begun on the same day in 12 of the 16 patients.) The effectiveness of such maintenance was judged by recording the ventricular rate at varying intervals for a period of two weeks. Electrocardiograms were taken in each case before injection of deslanoside and at intervals thereafter in order to check ventricular rates and to detect early toxic effects.

Results

Initial Effects.—Adequate response, with a 10% reduction of the ventricular rate, occurred in 17 trials in 15 patients; one patient failed to respond to two separate trials. The time after injection at which initial effects were observed varied from 22 minutes to 75 minutes, averaging 32.7 minutes.

Maintenance Dose.—Of the 12 patients placed on maintenance therapy with acetyldigitoxin, 7 received a daily dose of 0.1 mg. and 5 were given 0.2 mg. Ventricular rates recorded at intervals over a subsequent two-week period were lower in the patients who received 0.2 mg. than in those who received 0.1 mg.

From the medical services of the New York Polyclinic Hospital and the Gouverneur Hospital.

Pain at Side of Injection.—Of the 19 trials with intramuscular injection of deslanoside, pain at the side of injection was noted in 9 instances. This was classified as mild in two, moderate in two, and severe in five. In the severe cases the pain lasted from 2 to 10 days. If the two trials in which the pain was slight are omitted, there remain seven instances of moderate to severe pain; an incidence of almost 37%.

Toxic effects.—No toxic effects were noted.

Comment

Deslanoside has effects identical with those of lanatoside C, from which it is derived.[1] With intramuscular injection, effects are achieved about a half-hour slower than with the intravenous route, peak effects appearing in 60 to 90 minutes.[2] While it is generally recommended that the full dose of 1.6 mg. be given in divided doses, it may be given in a single dose without toxic effects.[3] In the cases herein reported, no toxic effects were observed in 16 trials with 1.6 mg. and 3 trials with 1.2 mg., despite beginning of maintenance therapy with acetyldigitoxin on the same day.

Although it is stated that deslanoside is suitable for intramuscular injection,[4] references to the incidence of pain at the site of injection are sparse. In this small series of cases, moderate to severe pain was noted in 37%. It is probable that the incidence of pain may be less if half the dose is given in each buttock rather than the entire dose in one buttock.

Summary

Digitalization by means of a single intramuscular injection of deslanoside (desacetyl-lanatoside C, lanatoside D) was carried out in 19 trials in 16 ambulatory patients, the dose being 1.6 mg. in 16 instances and 1.2 mg. in 3 instances. In 12 such trials, maintenance therapy with acetyldigitoxin was begun on the same day. Adequate digitalization was obtained in 15 of the 16 patients. No toxic effects were noted. Moderate to severe pain at the side of injection was noted in 7 of 19 trials, an incidence of 37%.

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COUNCIL ON FOODS AND NUTRITION

Report to the Council

The Council has authorized publication of the following report. This article is part of a nutrition education program which is assisted by the Nutrition Foundation, Inc.

PHILIP L. WHITE, SC.D., *Secretary.*

METABOLIC DEMANDS AS A FACTOR IN WEIGHT CONTROL

Herbert Pollack, M.D., New York, C. Frank Consolazio
and
Gerhard J. Isaac, A.B., *Denver*

The medico-actuarial height-weight tables of 1912 indicate definitely that the population as a whole gains weight with advancing years. For example, the average weight of a man 5 feet and 10 inches tall, aged 25, is 71.3 kg. (157 lb.), but of a man aged 55 years the weight is 78.6 kg. (173 lb.), a gain of 7.3 kg. (16 lb.). This evidence of actual gain in weight of the population may possibly give a clue to one of the causes of obesity.

What is universally accepted as the basic cause of obesity is an intake of calories in excess of metabolic demands. Obesity may result from an increased intake of calories in the presence of a constant output of energy, from a decreased output in the presence of a constant intake, or from any relative variation of the two. A great deal of attention has been given to the increased caloric intake aspect of weight gain. Undoubtedly this can b the principal cause of obesity, especially for those

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From the New York University Post-Graduate School of Medicine (Dr. Pollack) and the Army Medical Nutrition Laboratory, Fitzsimons General Hospital (Messrs. Consolazio and Isaac).

who become obese before early adulthood. Obesity most often develops in adult life when eating habits have been fairly well established. One may question the fact that a decrease in caloric expenditure is important in the weight gain of this group. A review and analysis of the "calorie cost of living" is indicated to determine the reasons for this suspected decreased caloric requirement.

The following five main factors determine the "calorie cost" of life: (1) age, (2) body size, (3) sex (the three comprising the basal metabolic requirements), (4) physical activity—work output, and (5) type of food—specific dynamic action. These factors are listed in the order of their relative importance for all persons except those who do extremely vigorous manual labor. (In the United States, mechanical horsepower has replaced, to a large extent, human caloric expenditure for very heavy physical work.)

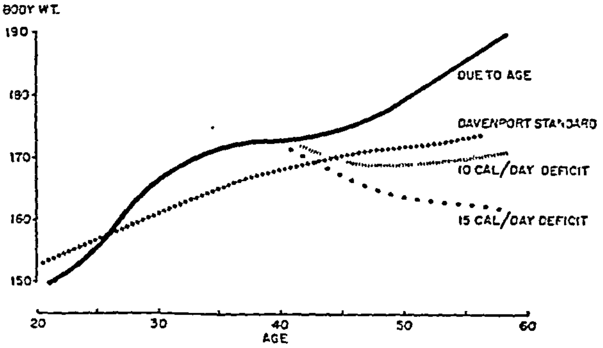
Basal Metabolic Requirements

For the average white-collar worker and housewife, the basal caloric requirements constitute one-half to two-thirds the total calorie requirements for the day. This is expressed frequently in the textbooks. They state, "Calculate the basal requirements and add 50% of this value to determine the total cost." If the basal requirements are such a large fraction of the total, it becomes necessary to analyze the basal caloric expenditure of adults.

The caloric requirement per unit of body weight starts to decrease shortly after birth. Up to about the age of 14 for females and 18 for males, the increase in body weight (growth factor) is greater than the metabolic decrement per unit of body weight. This results in an increasing total caloric requirement through adolescence, that equilibrates in a person at about the age of 25 when optimum weight is achieved.

The decreasing metabolic requirements per unit of body weight become manifest in the presence of a constant intake. According to DuBois, for a man, aged 25, the basal caloric requirement is 37.4 calories for each square meter every hour, and for a man, aged 55, it is 35.3 calories per square meter per hour.[1] A man 5 feet and 10 inches tall, who weighs 71.3 kg. (157 lb.), has a surface area of 1.87 sq. m., and a man of the same height who weighs 78.6 kg. (173 lb.) has a surface area of 1.91 sq. m. Thus, the man weighing 71.3 kg. at age 25 requires 69.9 calories per hour, and the man weighing 78.6 kg. at age 55 requires 67.4 calories per hour. In 24 hours they require, respectively, 1,678 calories and 1,618 calories. But if the man at age 55 had retained his weight of 71.3 kg., he would require only 66.0 calories per hour or 1,584 calories in 24 hours.

The figure shows a curve drawn from data obtained by the calculation of the small decrement in caloric requirements associated with the aging process for a hypothetical man, 5 feet and 10 inches tall, who consumes food providing 2,800 calories a day over a period of years. The basal caloric requirements are corrected downward for aging and upward for each increment in weight gain. The net result is a positive caloric balance. The value of 3,500 calories is used as the equivalent of one pound in body weight for conversion purposes. The curve is essentially S-shaped, with the plateau in the middle 40's age group. If one superimposes on this curve another one drawn from the age, height, and weight tables published by the Life Insurance Actuarials in 1912, it is obvious that the trend of the curve based upon averaged actual measurements of a large cross section of the population is almost identical to the hypothetical curve drawn from the assumptive data. The similarity in the curves allows one to present certain hypotheses with respect to the overweight person found in aging population groups.



Body weight increase on a constant intake, 2,800 calories per day, and constant expenditure, correcting for decreased metabolism due to age.

Small increments of positive caloric balance over a period of time can result in pronounced obesity. This increment can be due to decreasing basal metabolic requirements. When this age decrement is coupled with decreasing physical activity, a common phenomenon in the present day population, a marked gain in weight can result. A difference of 10 to 15 calories per day over a period of 15 years can cause a difference of 4.5 to 6.8 kg. (10 to 15 lb.) of body weight. It will be shown later in this discussion that the difference between sitting and standing is sufficient to alter caloric expenditure by this increment. By application of the same reasoning of small increment changes to actual physical work, it is possible to emphasize the importance of activity in a weight control program. Very little can be done to change the basal metabolic requirements without upsetting the homeostatic mechanism upon which life depends. This leaves two possibilities to prevent the slow accumulation of fat: a decrease in calorie intake and an increase in the calorie requirements of the other factors, work and specific dynamic action.

Physical Activity Requirements

The energy expenditure of individuals may vary considerably. This is due to both a variation in the amount of work that they perform and in the individual variations in the calorie cost of such work. Certain components in the different work outputs of individuals are obvious and easily understood. A specific example illustrates this. Two men are working together to make a hole in a block of granite. One man stands still directing the cold chisel with a pair of tongs, while the other swings the heavy sledge hammer down onto the head of the chisel, picks it up, and swings again. Swinging a sledge hammer is a type of work that is independent of body size. The foot-pound expenditure depends largely on the size of the hammer and the distance through which it is swung. A small man will spend approximately as much energy lifting a sledge hammer as does a large man.

TABLE 1.—*Energy Expenditure in Walking as Affected by Velocity and Weight*[3]

Speed, Mph	Weight, Kg. (Lb.)				
	54.5 (120)	63.6 (140)	72.8 (160)	81.8 (180)	91 (200)
2.0					
Calories/min.	2.6	2.9	3.2	3.5	3.8
Calories/hr.	156	174	192	210	228
Calories/mile	78	87	96	105	114
2.5					
Calories/min.	3.1	3.5	3.8	4.2	4.5
Calories/hr.	186	210	228	252	270
Calories/mile	74	84	91	101	108
3.0					
Calories/min.	3.6	4.0	4.4	4.8	5.3
Calories/hr.	216	240	264	288	318
Calories/mile	72	80	88	96	106
3.5					
Calories/min.	4.2	4.6	5.0	5.4	6.1
Calories/hr.	232	276	300	324	366
Calories/mile	72	79	86	93	105
4.0					
Calories/min.	4.7	5.2	5.8	6.4	7.0
Calories/hr.	282	312	348	384	420
Calories/mile	71	78	87	96	105

The calorie cost of any type of activity that involves the whole body, such as walking, varies with the size of the body and, more specifically, with total body weight. In actual experiments a man weighing 61 kg. (134 lb.) who walked 3.5 mph spent 261 calories.[2] A man weighing 91 kg. (200 lb.) expended 366 calories walking the same distance at the same speed,[3] and a man weighing 99 kg. (218 lb.) expended 409 calories.[2] The addition of dead weight to the shoulder of an individual increases his caloric expenditure in the same order of magnitude. A man weighing 68.2 kg. (150 lb.) used 98.8 calories to walk one mile. Forty kilograms (88 lb.) of weight were then put on his shoulder, and the calorie cost of the mile increased to 142 calories.[4] It is no wonder that small people complain that they gain weight so easily.

It is a common fallacy to consider the speed of walking as an important factor in the calorie cost and to attribute the slowing down of the speed by the elderly person as contributing to the weight gain. Table 1 is based on the work of Margaria.[3] It demonstrates clearly that walking a mile, regardless of the rate of speed, costs essentially the same number of calories per unit of body weight. In fact, the cost is somewhat greater at the slower pace.

TABLE 2.—*Energy Expenditure in Various Activities*

	Calories/Min.	*Calories/Hr.*	Difference Between Each Preceding Activity, Calories/Hr.
Sleeping	1.09	65.40	...
Lying down	1.26	75.60	10.20
Sitting	1.35	81.00	5.40
Standing	1.50	90.00	9.00
Standing, light action	2.60	156.00	66.00

There are other seemingly insignificant differences in the daily habits of people that account for some weight gain differences over a long period of time. The differences in the calorie cost between lying down, sitting, standing quietly, and standing while moving in a limited area have been measured (table 2).[5] These differences may not seem large, but when multiplied by the total minutes during the day they loom larger. For example, there is a difference of almost nine calories an hour between sitting quietly and standing quietly. Those people who never stand still may burn 66 calories an hour more than their relaxed brother. In 70 hours the former burns the equivalent of one pound of body weight more than the other (calculate 3,500 calories per pound of body weight).

TABLE 3.—*Energy Expenditure in Traveling a Distance of 2.5 Miles*

	Speed, Mph	Time Consumed	Caloric Expenditure
Walking	2.5	1 hr.	210
Cycling	5.5	27 min.	122
Driving	25.0	6 min.	17

The mechanization of life in recent years has had an influence on the caloric expenditure. Some people have compensated by using this new leisure time for active sports, whereas others have not. For example, a man lives 2.5 miles from his work. Table 3 shows the caloric expenditure of walking, bicycling, or driving his automobile to work.[6] If cycling and driving are compensated for by adding the caloric requirements of standing for the remainder of the hour, the results shown in table 4 are found.

A typist who is 63 in. tall and weighs 54.5 kg. (120 lb.) uses 87.7 calories per hour in using the standard mechanical typewriter.[6] The same typist using an electrical typewriter expends only 72.9 calories per hour. For this individual there is a difference of 14.8 calories an hour, and for six hours of actual typing there is a saving of 90 calories with the power typewriter. For a five-day week it amounts to 450 calories; in 10 weeks this can be the equivalent of a pound of body weight, assuming a constant intake.

A farmer driving a tractor with a standard steering wheel during cultivation of a field expends 85 calories per square meter per hour, but if he uses power steering, he expends only 68 calories per square meter per hour. For a man who is 5 feet and 10 inches tall, weighing 68.2 kg. (150 lb.), with a surface area of 1.85 sq. m., this means 157 calories versus 126 calories every hour; in an eight-hour day there is a difference of 250 calories. Taking an average expenditure of 3,000 calories per day, this is an 8.6% difference in total daily caloric requirement. This saving is small when compared to the caloric requirement of the farmer who walks behind his horse-drawn plough. He expends 400 calories per hour.

The difference in calorie expenditure between two men on a weekend can be considerable. One man plays 18 holes of golf, walking about four miles in three hours, and expends 950 calories.[6] The other man gardens for three hours and expends only 580 calories.[7] One man goes out in the evening and dances for an hour and sits and talks for two hours, spending a total of 400 calories; the other man just sits for three hours and spends 275 calories.

Table 5 is presented to show the variations in caloric expenditures with various activities. It must be pointed out that in certain activities such as walking the motion is constant and the expenditure uniform throughout the time. In other activities such as tennis and football the motion is intermittent. The values expressed are for the periods of motion only. For an hour of tennis, a player may be in motion only about one-third of the time; the rest of the hour must be calculated as standing only.

TABLE 4.—*Energy Expenditure in One Hour When Traveling a Distance of 2.5 Miles*

	Time Consumed	Standing, Min.	Caloric Expenditure
Walking	1 hr.	0	210
Cycling	27 min.	33	171
Driving	6 min.	54	97

Summary

The importance of the calorie expenditure factor in the development of moderate obesity in the adult should not be minimized. It is important for persons to recognize that certain physiological changes take place in the human body that demand readjustment of the work and play habits or special attention to food intake. Small increments of excess intake and small decrements of decreased output together can be responsible for much adult obesity.

TABLE 5.—*Caloric Cost of Daily Living Activities and Sports in Men*[8]

Normal Activity	Cal./Min./ Sq. M.*	Sport	Cal./Min./ Sq. M.*
Sitting, normal	0.70	Football	5.04
Sitting, reading	0.70	Basketball	4.31
Sitting, eating	0.80	Ping-pong	2.42
Sitting, playing cards	0.83	Bowling	4.06
Resting in bed	0.68	Swimming	6.06
Standing, normal	0.81	Golfing	2.76
Standing, light activity	1.41	Tennis	3.50
Personal toilet	1.09	Squash	5.00
Shower	1.84	Table tennis	2.00
Dressing	1.84	Badminton	1.91
Making bed	2.64	Rowing	4.00
Shining shoes	2.11	Sailing	1.30
Mopping floor	2.67	Snooker pool	1.50
Walking indoors	1.68	Dancing	2.00
Walking outdoors	3.07	Riding	1.50
Walking upstairs	10.00	Boxing, sparring	5.00
Walking downstairs	3.80		
Kneeling	0.68		
Squatting	1.12		
Washing clothes	1.46		

* Based on basal metabolic rate of 0.59 calories per minute per square meter of surface area.

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THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

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Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

RADIATION HAZARDS AND THE RADIATION SYNDROME

INTEREST in radiation hazards has increased in recent years because of the new awareness of the possibility of somatic damage from exposure to small doses of penetrating ionizing radiations, evidence of an increase in the mutation rate of offspring from parents exposed to such radiations, and the increasing exposure to which the entire population is subjected.[1] A small and until recently unimportant background irradiation has always been a part of our environment. To that was added exposure through the diagnostic use of x-rays. We now have the growing problem of radioactive industrial wastes and fallout from nuclear weapons testing. Of these, the hazards from industrial wastes are by far the greatest.

In a comprehensive review of the acute radiation syndrome Gerstner[2] states that all types of penetrating ionizing radiations singly or combined produce one specific clinical picture. This is characterized within two hours after exposure by a sudden onset of anorexia, nausea, malaise, apathy, drowsiness, and fatigue. This progresses rapidly to vomiting and prostration within about eight hours after exposure and then rapidly subsides. By the second postradiation day there may be some residual nausea and vomiting, but by the third day there are usually no symptoms. This is not the true radiation sickness but its prodromal phase. The patient feels quite well during a latent period lasting through the 19th or 20th day, but then there is a sudden onset of chills, fever, malaise, and dyspnea on exertion. The syndrome progresses rapidly for two or three days, when purpura, hemorrhages, and infections, especially of the mouth, occur. Blood examination reveals leukopenia, thrombocytopenia, and anemia. This aplastic anemia progresses, and on about the 30th day there is a crisis. If the patient survives past this time he starts to improve between the 40th and 50th day, and convalescence is usually complete by the 90th postradiation day. Individual variations depend on the size of the dose and individual susceptibility.

Unfortunately, both of these variables are difficult to estimate accurately, but it can be stated that whole-body exposure to 1 to 50 r will usually produce no symptoms. In an emergency situation those whose exposure is believed to be in this range present no medical problem, but if the dose is between 31 and 50 r the mutation rate in offspring is likely to be double the expected rate. If the radiation dose is 51 to 100 r the symptoms will be trivial except in a few highly susceptible persons. If it is between 101 and 150 r the symptoms will be mild and hospitalization will not be required, but if it is between 151 and 200 r about 67% of the victims will develop the acute radiation syndrome. Some of these will require hospitalization, transfusions, and antibiotics, but their prognosis is good. They should all be back at work in three or four months, but complete hematological recovery takes longer. If the dose is between 201 and 400 r hospitalization and intensive treatment will be required. If this is done promptly most but not all will survive. If the dose is between 401 and 500 r the amount of damage to the bone marrow will determine the outcome but the prognosis in general will be poor. If the dose is between 501 and 600 r direct damage to the epithelium of the gastrointestinal tract occurs and survival depends on how effectively this can be combated.

Price[3] calls attention to the pressing need for the development of adequate protective measures before widespread casualties have occurred through neglect. As more and more industries develop sources of nuclear power their efforts to cut costs must be closely watched to assure that this is not done at the expense of increasing hazards. Diagnostic x-ray machines have been improved to the point where the exposure of the patient is cut in some cases to 1/35th of the former level. The guiding principle is that no exposure level that is capable of reduction should be considered a safe level

If all the aspects of this problem that require prompt action are to get it, it is essential that the public be intelligently alerted to the need for a greatly expanded radiological health program. Such a program must avoid creating fears that would hamper constructive development.

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ORGANIZATION SECTION

FORUM ON MEDICAL PRACTICE

Ten experts in the social, legal, and economic aspects of medicine painted an up-to-date picture of these factors for an audience of 800 physicians in Washington, D. C., on March 27. It was the first of a planned series of forums on "The Doctor and His Practice," co-sponsored by The Wm. S. Merrell Company of Cincinnati, pharmaceutical manufacturer, and (at the latest forum) the Medical Council of the Washington Metropolitan Area. Among the speakers were C. Joseph Stetler, Director of the American Medical Association Law Department, and Bernard D. Hirsh, A. M. A. Tax Attorney.

Stetler reported the results of a two-year study of professional liability, which indicated that the vast majority of claims and suits against doctors have not been justly founded. He said: "In some localities the likelihood of being sued is becoming so great that the practicing physician must recognize that it constitutes a definite occupational hazard. . . . Doctors have achieved such good results so often that many patients expect a perfect solution to most medical problems."

Stetler said the survey showed that 14% of all A. M. A. physician members—approximately 18,500 doctors—have had medical professional liability claim or suit brought against them. By states, the highest proportion, 25%, was in California and the lowest 3%, in South Carolina. However, nearly half of these actions were either dropped after filing or decided in favor of the physician. Citing the study results for illustrative purposes, Stetler pictured "the composite defendant physician" as a full-time specialist, in active practice for 13.4 years, who was accused by a 34.4-year-old housewife patient because of surgery performed in a hospital—and who "quite possibly" can attribute precipitation of the claim to a derogatory comment of some other physician.

Hirsh, in his presentation, suggested that large medical clinics having numerous partners "re-examine their organizations, operations, and tax practices in the light of the possibility that they may be considered associations taxable as corporations." He pointed out that the A. M. A. House of Delegates last December adopted a resolution which not only recognizes the propriety of group medical practice through unincorporated associations, but corporate practice as well where it is permitted by law (as in Connecticut and Oklahoma) and exists under the exclusive ownership and management of physicians.

Ernest Dichter, director of the Institute for Motivational Research, told the medical audience: "The doctor who treats his patients as if they were intelligent, aware people with a perfect right to understand the diagnosis and the treatment prescribed, will find his patients responding with acceptance and loyalty."

Speaking on medical office management, George W. Condit, a consultant in that field, said: "The average doctor looks at the matter of placing a financial evaluation on his services as the illegitimate offspring that he has created in his marriage to the profession. While these illegitimates cannot be ignored completely, their needs can be overlooked—except for those times when the check book begins to wheeze a little plaintively."

The luncheon speaker—on the topic of stress in the world, the individual, and the doctor—was Dr. Howard A. Rusk, director of the department of physical medicine and rehabilitation at the New York University-Bellevue Medical Center. Other forum presentations were by Wisconsin attorney Robert B. Murphy on tax program planning, Cleveland attorney R. Crawford Morris on professional liability, investment consultant Carl Holzheimer; insurance company executive James A. Eubanks; and estate planning consultant Amiel Caplan.

NEW EXHIBITS FOR THE PUBLIC

The A. M. A. Bureau of Exhibits announces that a number of new exhibits will be ready for showings by local medical societies at fairs, home shows, schools, and similar public gatherings this spring and summer.

You Can Reduce.—This exhibit shows foods to fill up on and those to stay away from; it gives the visitor an opportunity to check his weight on the scales, presents answers to pertinent questions on reducing, and pictures 25 different foods and the number of calories in the servings shown.

Food and Nutrition Quackery.—Developed in cooperation with the U. S. Food and Drug Administration, the Post Office Department's fraud division, and the National Better Business Bureau to point up the false claims made in the promotion of food products and nutrition ideas, this exhibit exposes house-to-house peddlers of "food supplements," nutrition and health lecturers and so-called experts; displays various reducing aids on a roulette wheel; and features a "buyer beware" section explaining how the public can recognize food quacks and their claims.

Breathing.—This exhibit presents the anatomy of the respiratory system. The viewer can see how lungs expand and contract and how the ribs move.

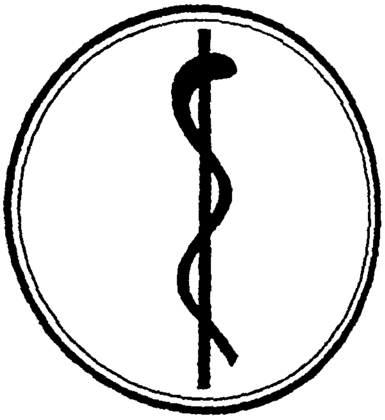
Glands.—The location and functions of various glands in the body are shown in this exhibit, which presents three-dimensional models of glands.

Poisoning of Children.—Dangers of common household products are demonstrated in this exhibit, which depicts those products that are leading causes of poisonings in children at home.

Health Appraisal of the School Child.—Highlights of principal health appraisal procedures, such as teacher observation, dental and medical examinations, and the follow-through are shown in this exhibit.

LIECHTENSTEIN APPROVES EMBLEM

The Liechtenstein Medical Association has become the first of 53 members of the World Medical Association to obtain official government recognition of the WMA emblem for identifying and safeguarding civilian medical care units in time of national emergency. The international civil defense emblem was adopted at the 10th WMA assembly recently after it was learned that the Red Cross and the Geneva Convention of 1949 protect health teams during disaster situations only if these teams are part of the national military organization. The red emblem (see figure) has been approved by many member associations and transmitted to their governments (including the United States) for legislative authorization. The 15 doctors from Liechtenstein serve a population of 13,571 in an area of 62 square miles.



COUNCIL ON MEDICAL SERVICE

PLACEMENT OF PHYSICIANS IN NORTH CAROLINA

The Medical Society of the State of North Carolina is interested in the areas of the state that need more medical care, with particular emphasis on (1) the small communities having no resident physician and (2) the communities with an overworked physician or physicians. This statement is borne out by the physicians' placement service activity.

Background

A recent 10-year progress report on health and medical care improvements in North Carolina indicates that in 1946 there were 2,104 physicians in North Carolina, giving a physician-population ratio of 1:1,733. In 1956 the state had 3,317 physicians with a physician-population ratio of 1:1,317. Fifty per cent of the 100 counties in North Carolina have at least one physician for every 2,000 people, while 9% of this group have a population of 1,000 or less per physician. Twelve per cent of the counties have a population of 5,000 or more per physician.

The formal, well-established placement service under the personal supervision of Mr. James T. Barnes, Executive Secretary of the Medical Society of the State of North Carolina, has done much to improve medical care in the rural and semirural areas of the state. Mr. Barnes, who is a native of North Carolina, knows personally the medical service available, as well as that needed, in every corner of the state. This firsthand information has been of value both to the physician and to the community seeking a physician. For the past several years Mr. Barnes has had the assistance of Mrs. Annette S. Boutwell, Health Education Consultant, for the medical society. Mrs. Boutwell's extensive field work has been helpful to the communities seeking a physician and to the physicians seeking a location for practice.

Community Requests for General Practitioners

When a community leader or committee contacts the state office, either by letter or by personal visit, requesting assistance in securing a physician, a questionnaire "Information from Community Concerning Location for General Practitioner" is offered for completion. This gives a file copy of the story of the medical assets and needs of the community as well as the factors that would make the place attractive to the physician's family.

The form is based on the one prepared by the Committee on Medical and Related Facilities of the A. M. A.'s Council on Medical Service. One item on the form that is often answered sketchily is: "Describe any additional community assets which might attract a physician." Field work on the part of the state society staff offers valuable supplementary information, particularly with respect to this item. For this reason, too, verification of the medical need of the community is not required from the county medical society. However, it is strongly recommended by the staff members that any physician visiting a potential practice location make it a point to call on the nearest physicians and hospitals.

Some of the communities build medical facilities and even homes before requesting the assistance of the state medical society in securing a physician. If consulted first, the society advocates securing a physician before undertaking any construction, although it is considered wise to have the money available for any projected building program.

Communities that are in the beginning stages of seeking a physician are encouraged to form a committee from among the community leaders. The committee often visits the state office as a first step. With guidance from that source the committee takes an inventory from the viewpoint of the medical needs of the community and from that of the physician, who would also be considering the location with regard to the desirability for his family. Some points which the community would want to consider are (1) doctor-population ratio, (2) distance to nearest adequate medical care, (3) age of physicians serving the area, (4) need as seen by those living in the community, and (5) the interest of the community in improving the situation.

From the standpoint of the physician, the community needs to consider the (1) hospital facilities, (2) office facilities offered by the community, (3) opportunity for assured income, such as industrial accounts, health officer, or other sources, (4) facilities for family life, as housing, schools, churches, and social opportunities, (5) availability of postgraduate education, (6) possibility of coverage during vacation, and (7) proximity to a large medical center.

The Community Development Program in North Carolina has been responsible during recent years for much of the activity toward improvement in (1) incomes, (2) homes, (3) youth programs, (4) agriculture, and (5) community life in general. Half a dozen such area programs now functioning in the state encompass a total of 41 counties with an additional 16 counties being organized into another area program. The encouragement offered by these programs has helped in channeling many one crop areas into diversified farming with emphasis on the small farm operated by a resident landowner rather than the single-crop plantation which is too often under absentee ownership. Improvements and signs of growth that are evident in the four topographical sections—the Mountain, the Piedmont, the Coastal Plain, and the Tidewater—are making the communities more attractive both to lifetime residents and to industries seeking a new location.

Under the aegis of the governor's current program for expansion of small industry, many plant installations and developments can be cited. An example is Swift and Company's five-million-dollar animal products processing plant encompassing all of the Coastal Plain and Tidewater sections of the state. This plant is not only encouraging industrial employment but is also building a diversified agricultural program which will raise the income level of rural people in these sections of the state. Similar projects characterize the movement in other regional divisions of the state. This trend bespeaks the ever increasing need for medical and health services throughout the state and points up opportunities to physicians seeking location for practice. Confirming this trend, in one county of the state, 85 new industries were established during the year 1957.

Processing the requests of communities seeking a physician usually falls into the following three steps: 1. A list of physicians, with a current address, is made available to community leaders. This list, which contains the names of physicians who have requested location information for the state of North Carolina, includes physicians currently completing an internship or residency, physicians who wish to relocate, and physicians who are being released from military service. Biographical data is not supplied with this list. Community leaders may contact these physicians and make known the medical needs of the town. It is also the responsibility of the leaders to check the references just as the physician is responsible for securing community data. 2. The name of the town, with the name of the responsible person or persons to be contacted for further information, is added to the state list of communities seeking a physician. 3. Once a town is placed on the state list it is not removed until medical care is secured. The first town to request the assistance of the present executive secretary when he joined the staff 10 years ago was listed until two years ago, when a young man from the county completed his medical training and set up practice in the town. In order to better serve inquiring physicians who express an interest in practicing in North Carolina, every effort is made to keep the files on real medical needs of communities up to date at all times. To ascertain whether the position listed with the state office has been filled or not, a follow-up form is sent at intervals of six months to the community contact person.

Then there are the communities that secure a doctor and lose him—by death, to the services, or to a specialized field. The state society has a helping hand to offer each time requested. Recently a town was aided in securing the third physician in two years. Other communities can offer similar accounts. At the present time the list of communities seeking a general practitioner in North Carolina totals 143. This list includes both opportunities for solo practice and for association.

Requests received from communities outside North Carolina for assistance in securing a physician are not listed. The state medical society is familiar wih the medical needs of North Carolina, but it does not feel justified in evaluating a community request from another state. Such a request could be from a town where additional medical care is not needed. Out-of-state inquiries are referred to the Physicians Placement Service of the A. M. A.'s Council on Medical Service, which serves as a clearing house for requests from the community and physician.

Success Stories

A sample of the community-physician success stories found in the files of the Medical Society of the State of North Carolina is given in the thumbnail descriptions listed below:

Windsor's Crossroads:—Under the leadership of the 30-member grange, Windsor's Crossroads, an unincorporated community of 125 families, raised the funds to build a six-room medical facility. With the cooperation of the press and of physicians in the neighboring towns of Yadkinville and Statesville, the physician committee succeeded in getting a Kansas-born physician to establish his practice in this community in the foothills of the Blue Ridge Mountains. The physician was offered, and he accepted, the opportunity to purchase the building after his practice was established. For their effort, the people of Windsor's Crossroads secured not only a physician but also the $1,000 award for first place in the North Carolina State Grange Community Service Contest and the fourth place award in the national grange contest.

Magnolia:—Postal cards received by the Medical Society of the State of North Carolina over a period of 10 years from a woman who sought a physician for her town stopped about two years ago. The Lions Club had caught the enthusiasm for securing a resident physician for Magnolia. When a young physician returned to his home county for Easter vacation, members of the executive committee of the Lions Club persuaded him to leave Baltimore and return to Magnolia to practice. He is now buying the medical facility built by the people of this community of 585.

Rock Ridge:—Rock Ridge, an unincorporated community with a school as up to date as any city system and with attractive, well-kept homes that would hold their own in "Anywhere," U. S. A., has recently secured a physician for its clinic. Standing side by side in front of a grove of tall pine trees are two clinic buildings. One is a two-room facility in which Thomas G. Bradshaw, M.D., practiced for 30 years, until his death a few years ago. The other, a neat eight-room cement block building with inlaid floors and Venetian blinds, is now fully equipped and occupied by a physician who recently completed his training. This facility could accommodate two physicians.

Saxapahaw:—Saxapahaw, a community of 600, built a physician's home and had construction on a clinic well under way before the physician committee visited the office of the state medical society to request aid in securing a physician. Plans were to make these structures available to a physician on a rental basis. Typical of the spirit of the community is the fact that securing and losing a doctor three times did not prevent them from finding a fourth physician. The first physician went into a specialty in another state; the second, who was a bachelor, decided that a physician with a family would fit better into a rural community. The third physician died early in his career. With their fourth physician, Saxapahaw is again enjoying local medical service.

Sealevel:—Sealevel, an isthmus seacoast community of 466 is connected with the North Carolina mainland by extended dry-weather-road and boat service. A 24-bed hospital-clinic built by two brothers who grew up in the community is now administered by a local board. A $10,000 guarantee was offered to attract a physician, with special training in surgery, to move to the doctorless island. The surgically trained, general physician who accepted the offer made well above the amount which had been guaranteed, obviating any payment. Within 18 months he was joined by a full-time surgeon. Now, with a recently completed 20-bed addition to the hospital, consideration is being given to adding an internist to the group.

It took a special trip to the state society office to see these and the many other similar accounts portraying the good results brought about by the cooperation between the communities of the state and organized medicine. The staff is of the opinion that their time is better spent in assisting physicians and those seeking their services in getting together than in talking about what has already been accomplished.

Requests for Specialists

Although the greatest immediate demand is for more physicians practicing general medicine, assistance is also available to those seeking a specialist. When a request is received by the state office from (1) a specialist seeking an associate, (2) a group practice planning to add to the staff, or (3) community leaders who feel that the area can utilize and support the services of specialists, a questionnaire is presented requesting pertinent information that would be of value to an inquiring physician. In many cases the secretary of the county medical society will notify the state medical society of likely opportunities for specialists. The state placement service compiles a list of the towns where the need for a specialist has been indicated, with the address of a person to contact for further information. Lists are prepared for opportunities in otorhinolaryngology, internal medicine, obstetrics and gynecology, orthopedics, pediatrics, surgery, and urology. At intervals of about six months, follow-ups are made to determine whether specialty openings have been filled.

Referral may also be made to a number of the national specialty organizations which maintain placement services. A copy of the information is also made available to the A. M. A. for the use of physicians who visit that office.

Physician Inquiries

North Carolina is fortunate in having three medical schools: (1) the University of North Carolina School of Medicine at Chapel Hill, (2) the Bowman Gray School of Medicine of Wake Forest College at Winston-Salem, and (3) Duke University School of Medicine at Durham. In 1957 the graduates from these schools totaled 192. While they are still in medical school these future physicians direct many inquiries to the placement service of the Medical Society of the State of North Carolina. The inquirers realize that the list of opportunities changes frequently, but some idea is gained of the supply and demand.

Other sources of physician placement inquiries are from the physicians who (1) are being released from service, particularly those from nearby Fort Bragg, Camp LeJeune, and the Norfolk Navy Base, (2) are completing their medical training as interns or residents, and (3) wish to relocate. Physicians who make inquiry from the A. M. A. Physicians Placement Service relative to opportunities in North Carolina are also referred to the state office for assistance.

When a physician makes inquiry from the state office about opportunities for practice, a questionnaire, "Information from Physician Seeking a Location," is offered for completion. This form provides, in addition to the physician's personal data, his medical training, military status, and the type of practice in which he is interested. Immediate processing of the returned questionnaire includes (1) adding the physician's name and address to the state list of available physicians, which is sent to the communities seeking a physician, and (2) sending the physician a personal letter with (*a*) a list of communities seeking a physician, (*b*) a highway map of North Carolina, and (*c*) a copy of the current annual issue of the "North Carolina Travelbook," edited by Ken Knight. In the letter it is suggested that the physician check the list of communities with the map and the travelbook, then write the state society for further information on the specific communities in which he is interested. Mr. Barnes incorporates into the letter the facts received directly from people in the community as well as his own firsthand information about the area. After securing as much information as possible by correspondence, the physician seeking a location is encouraged to visit the communities that appear most interesting to him and to his family.

More than 10% of the physicians now practicing in North Carolina were assisted by the Medical Society of the State of North Carolina in finding a location. The function of placement has contributed in some measure to the growth of the society membership, which in a decade has increased by 52%.

Medical Survey

To further assist the physician seeking a location, a medical practice survey was made of the members of the state society in 1957. In the survey 34 fields of medicine were taken into consideration, including (1) general practice, (2) the specialties, (3) industrial medicine, and (4) public health. A breakdown of the 34 fields of medicine indicates 1,098 physicians active in general practice, 1,781 in specialties, 11 in industrial medicine, 70 in public health, and 27 in other branches.

As previously stated, a mimeographed list of communities seeking a general practitioner is available to the inquiring physician, with detailed information available through a letter, on request. These communities are areas that have requested assistance in securing more medical care. There are other areas that have not requested aid that could very well support additional general practitioners. If a physician is interested in a particular town in North Carolina but does not find it on the list for physicians needed, the state society will supply information to help him evaluate the location as to medical need. This information lists the number of (1) general practitioners, (2) internists, and (3) surgeons, by age group in each county, as well as the county population. While these are not the only factors to be considered, they are important ones.

Table 1.—*Number of General Practitioners, Internists, and Surgeons, According to Age Group*

Age Group	General Practitioners	Internists	Surgeons	Total
Under 30	131	7		138
30-40	339	179	135	653
40-50	247	104	124	475
50-60	157	45	63	265
60 or over	212	35	55	302

It is interesting to note from the summary of the information found in table 1 that the largest number of general practitioners, internists, and surgeons occurs in the 30-to-40-year age range. This range accounts for 36% of the total number of practicing physicians in the three physician-groups: general practice, surgery, and internal medicine. Of the total number of practicing physicians in the three groups mentioned above, 69% are 50 years of age or less. The largest number of internists are under 40. More general practitioners, as well as more surgeons, are under 50. Although, according to figures from the 1956 edition of the A. M. A. Medical Directory, North Carolina is in the lowest quarter of the states when considering the physician-population ratio, there are several factors that offer encouragement in the belief that this picture will continue to improve, namely, (1) interest of the doctors within the state in bringing in additional physicians, as evidenced by the potential opportunities listed by the secretaries of the county medical societies; (2) the steady drive on the part of the staff of the state medical society to improve this situation; and (3) the high percentage of physicians found in the younger half of the age classification.

Table 2.—*Number of Physicians, According to Type of Practice in the Eight Counties of North Carolina with a Population over 100,000*

County	Population	General Practitioners	Internists	Surgeons	Other	Total
Buncome	135,749	28	26	21	94	172
Cumberland	122,608	9	11	7	21	51
Durham	117,147	12	38	21	101	172
Forsyth	160,388	32	40	23	104	199
Gaston	127,728	37	5	8	17	67
Guilford	217,984	44	39	32	96	211
Mecklenburg	229,856	37	48	35	146	266
Wake	155,592	32	24	15	72	143
Total	1,267,046	231	231	165	654	1,281

As indicated in table 2, the eight counties of North Carolina with an individual population of 100,000 or more account for approximately 30% of the state's population. In these same counties are to be found about 39% of the state's 3,317 physicians. The percentage difference would be even smaller if the number of physicians in public health, medical education, hospital administration, industrial medicine, and other related fields, were not included in this count.

Consideration of these figures might leave the impression that though the physician-population ratio is not up to the national average, the physicians available are well-distributed. This is true for the counties with the largest population. Checking on the counties with a population under 100,000 shows such an exception as Orange County with a population of 42,671 and 78 physicians.

However, 11 of the 100 counties in the state have a physician-population ratio of 5,000 or more. Table 3 lists these counties with their population and the number of practicing physicians.

Table 3.—*Number of Practicing Physicians per County in North Carolina in Counties with Physician-Population Ratio of 1:5,000*

County	Population	Practicing Physicians
Brunswick	20,768	3
Camden	5,065	1
Caswell	21,479	3
Clay	5,716	1
Davie	15,790	3
Gates	9,199	2
Greene	17,654	2
Hyde	5,479	1
Jones	11,062	1
Onslow	59,527	12
Pender	18,938	4

Although the need and the opportunity are foremost for the general practitioner, he is not the only one who can secure specific information about areas where his services are needed—whether a community request has been listed or not. Figures available for the specialists include (1) a state total of physicians who have indicated that their practice is limited to a given specialty, and (2) a breakdown of this figure by county, if the inquiring physician indicates in his letter the specific counties in which he is interested. For example, an inquiring ophthalmologist will be informed that there are 44 specialists in his field, or 1 per 100,000. There are 127 physicians, or 1 per 35,000, who limit their practice to the related field of otolaryngology.

Figures used in this material came from the survey cards prepared by the Medical Society of the state of North Carolina and from the "Ten Year Progress Report on Health and Medical Care Improvements in North Carolina." The State Society used membership as a basis for physician-population ratio.

MEDICINE AND THE LAW

REVIEW OF MEDICAL PROFESSIONAL LIABILITY CLAIMS AND SUITS

This article is an illustrated summary and compilation of information dealing with medical professional liability obtained from (1) an opinion survey of members of the American Medical Association; (2) a review of the history of reported medical professional liability suits; (3) a survey of medical professional liability experience in California; and (4) a survey of medical professional liability experience in Alameda-Contra Costa counties, California.—ED.

Approximately 18,500 living physicians in the United States who are members of the American Medical Association, or about one out of every seven, have had a medical professional liability claim or suit brought against them at some time in their careers. Of those who have had a claim or suit brought against them, 13% have had more than one.

Multiple Claims and Suits

In California, 1 out of every 4 physicians have had a claim or suit, while in South Carolina the figure is less than 1 out of every 33. The incidence of such claims and suits in all other states falls between these ratios.

The median number of years in practice of physicians who have had a claim or suit brought against them is 13.4 years. Thus, there are as many physicians involved who have been practicing more than 13.4 years as there are with fewer years of practice.[1] These figures are not too startling when we realize that they represent all of the claims and suits brought against living physicians whose periods of practice range from 1 year to as long as 50 years. Furthermore, 40% of all of the claims and suits have either been dropped or decided in favor of the physician.

Professional Liability Trends

The first reported [2] medical professional liability case in the United States was decided in Connecticut in 1794. From that time until 1900 there were only 224 reported cases in the entire country. From 1900 through 1955 1,712 cases were reported.[3]

Up until 1900 on the basis of the total number of reported cases the state of New York led the country, followed in order by Indiana, Illinois, Pennsylvania, Ohio, and Maine. The study of incidence by states based on the total number of reported cases through 1955 showed the first to be California, the second New York, the third Ohio, the fourth Missouri, the fifth Washington and the sixth Illinois and Minnesota. Delaware is the only state that has had no reported medical professional liability suit through 1955. The greatest number of reported medical professional liability cases for any five-year period has been from 1930 through 1935, when there were 244.

Results of Professional Liability Surveys

Recently, the results of three studies on medical professional liability have been published: One on a national level, by the American Medical Association,[4] a second on a state level, by the California Medical Association;[5] and a third on a county level by the Alameda-Contra Costa counties Medical Association.[6] The similarity of the results of these studies is most striking.

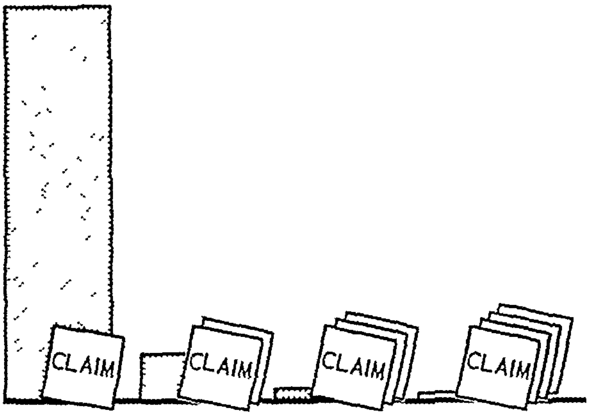


Fig. 1.—Multiple claims and suits

On the basis of the national study, we find that specialists, who make up about 44% of the physician population, are the defendants in medical professional liability claims or suits about 50% of the time. In the state of California the specialist comprises 58% of the physician population and is the defendant 57% of the time. In Alameda-Contra Costa counties 55% of the physician population are specialists, and they account for 46% of the claims and suits.

Sixty-three per cent of the medical professional liability claims and suits across the country stem from a surgical act; in California, 63% of the claims and suits arise from surgical acts, and in Alameda-Contra Costa counties 68% of the cases are surgical.

The alleged negligent act is performed in the hospital in 67% of the cases over the country. In California 71% of the alleged negligent acts are performed in the hospital, and in Alameda-Contra Costa counties some 70% of the alleged negligent acts are performed in the hospital.

Medical Society Prevention and Review Programs

Twenty-one state medical societies have initiated claims prevention programs and 31 states have claims review programs on a state or county level. Activities in connection with claims prevention programs include lectures, panel discussions, and the distribution of literature on the subject of medical professional liability. The prevention programs, in general, consist of a mechanism whereby the defendant physicians' colleagues evaluate the validity of a claim or suit for the purpose of advising the defendant or his insurance carrier.

Comparison of Survey Data: Professional Liability

	County (Alameda-Contra Costa)	State (California)	National
Hospital cases, %	70.0	71.0	67.0
Surgical cases, %	68.0	62.9	63.1
Medical cases, %	18.4	16.8	20.0
General Practice, %	54.4	43.4	47.0
Specialist, %	45.6	56.6	50.4
Claimant			
Male, %	39.0	41.0	44.0
Female, %	61.0	59.0	56.0

In California the medical and legal professions have recently formulated a program whereby a panel of physicians are made available for consultation and as witnesses in medical professional liability cases. The physicians are appointed to this panel by the local medical society with the approval of the local bar associations.

Insurance Facts and Figures

Ninety-three per cent of the physicians in the country carry medical professional liability insurance which is underwritten by a least 45 carriers. Not all of the companies do business in every state, and 21 are active in only one or two states. Thirteen state medical societies have either a group insurance program or have endorsed a particular policy. In addition, the physicians in at least one state have recently formed their own stock insurance company which offers professional liability insurance to the physicians of that state. Nine out of 10 physicians in the country have no difficulty in obtaining medical professional liability insurance.

Difficulty in Obtaining Insurance

Generally, even physicians who have experienced a claim or suit do not have difficulty in obtaining insurance coverage. Furthermore, most physicians believe that their insurance rates are reasonable.

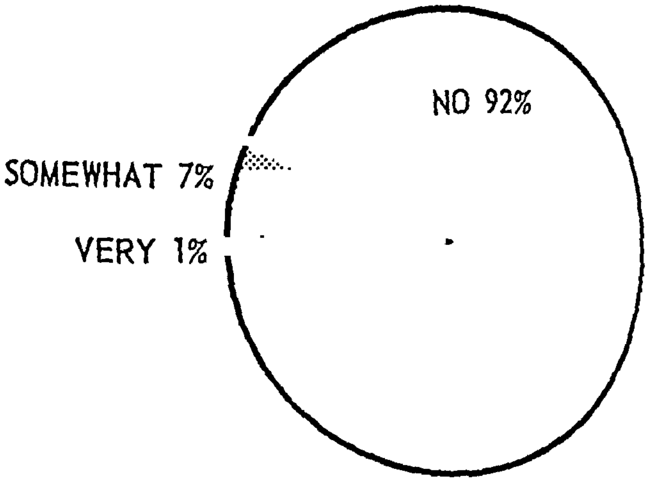


Fig. 2.—Difficulty in obtaining insurance.

In 1956 the median amount of medical professional liability insurance carried by general practitioners was $25,000/$75,000 and by surgeons $100,000/$300,000.

Primary and Secondary Causes of Claims and Suits

Medical professional liability claims and suits are initiated for a variety of reasons. The primary reason in 24% of the claims and suits is poor operative results; in 20%, poor medical results; in 10%, errors in diagnosis; and in 9%, foreign bodies left in the patient. The remaining reasons accounted for no more than 8% each.

Twenty-seven per cent of the secondary causes are under the direct control of the medical profession and include careless comment about another physician and situations in which the patient had another disease or disability which was not properly diagnosed or which progressed badly. Twenty-two per cent of the secondary causes consisted of pressures or influences exerted on the claimant by such

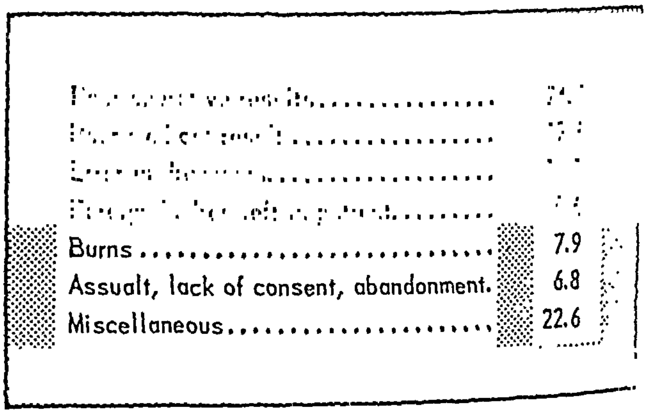


Fig. 3.—Primary reasons for claims.

outsiders as attorneys or relatives. The patient himself is a producing factor in 25% of the secondary causes. The factors included in this category are the bringing of claims for financial profit, the avoidance of paying a medical bill, confusion because of a mental disability, or the fact that the patient was an alcoholic or a narcotic addict.

Status of Claims and Suits

The following figures indicate the percentages of medical professional liability claims and suits that are pending, dropped, compromised, or settled as well as the percentage of suits decided for or against the claimant. It will be noted that 33% of the claims and 29% (20 plus 9%) of the suits result in the claimant obtaining some money from the defendant physician, and 17% of the claims and 53% (12 plus 41%) of the suits terminate without the claimant obtaining any money from the defendant.

Summary

From all of the facts and statistics available, it is possible to picture the composite national claimant as 34.4 years old, a housewife who is most probably dissatisfied with an allegedly poor operative result. The national composite defendant physician appears to be a full-time specialist in active private practice. He has probably been in practice for 13.4 years and carried medical professional liability insurance at the time of the alleged negligent act. The incident complained of most probably occurred in a hospital. It involved surgery and was quite possibly precipitated into a claim because of a comment by some other physician. The claim probably went on to suit but, if so, the patient probably did not receive an award or settlement. After the claim or suit was disposed of, the physician did not experience difficulty in obtaining or renewing his medical professional liability insurance.

Careless comment by another physician	25.2%
Action prompted by attorney	15.4
Claim brought for financial profit	13.3
Patient had a mental disability	7.9
Action prompted by relatives	7.7
Patient was alcoholic or narcotic addict	2.9
Patient had another disease or disability which progressed badly	2.1
Miscellaneous, not possible to classify	25.5

Fig. 4.—Secondary reasons for claims.

Analyzed in retrospect, nearly all medical professional liability claims and suits are theoretically preventable. For many years, however, the profession has been stymied in its efforts to combat this serious problem because no comprehensive study had been made of the problem. Now, the results of three studies are available. Armed with this information, the profession should be able to move forward with greater confidence and with better success in its battle with this problem. Active and effective prevention programs must be initiated and implemented at the local, state, and national level. These programs should encourage the adoption of methods of conducting a medical practice which will minimize professional errors and reduce the likelihood of having claims filed in the event of an untoward or poor result.

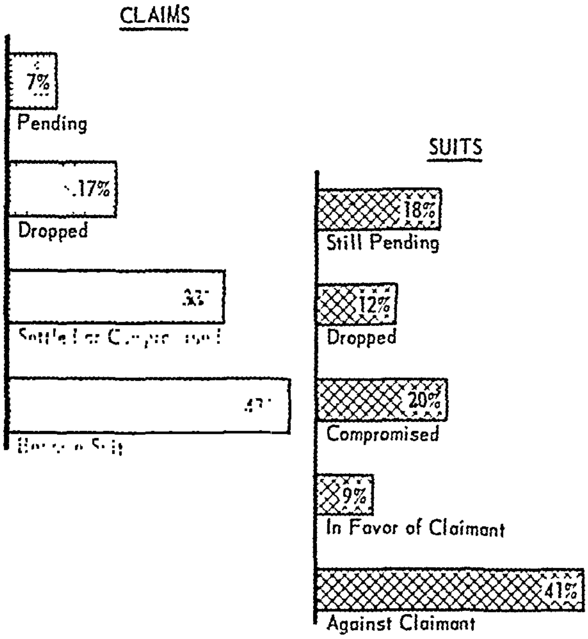


Fig. 5.—Disposition of claims and suits.

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MEDICAL NEWS

DISTRICT OF COLUMBIA

Alumni Meeting at Freedmen's Hospital.—The 36th annual meeting of the Association of Former Internes and Residents of Freedmen's Hospital will be held at the hospital June 3-5. A golf tournament will precede the convention. The scientific meetings will be held in the Biology Building of Howard University. For information write Dr. George L. Johnson, Chairman of Publicity, Association of Former Internes and Residents of Freedmen's Hospital, 1336 W Street, N.W., Washington 9, D. C.

Personal.—Dr. John F. Nancarrow, of Chevy Chase, has been appointed head of the department of hematology at the Washington Hospital Center. Dr. Nancarrow was formerly head of the hematology department at the National Naval Medical Center, Bethesda.——Dr. William B. Walsh on Jan. 15 was among five persons named to the National Advisory Committee on the Selection of Physicians, Dentists, and Allied Specialists, an advisory committee to Selective Service which will coordinate the needs of the armed forces for physicians and dentists with civilian needs. The following day his appointment to the Health Resources Advisory Committee of the Office of Defense Mobilization was announced. This committee will advise the director of ODM on matters in the health field as they relate to mobilization programs.——Dr. Murray M. Copeland, professor of oncology at Georgetown University, has been appointed to the National Advisory Cancer Council, for a term of office ending Sept. 30, 1961. As a member of the council, Dr. Copeland will advise and make recommendations to the Surgeon General regarding research activities of the National Cancer Institute.

FLORIDA

Annual State Medical Convention.—The 84th annual convention of the Florida State Medical Association will be held May 11-14 at the Americana Hotel, Bal Harbor. Dr. Nelson Zivitz, president, Dade County Medical Association, will open the general sessions with an address May 12, after which the following presentations by out-of-state speakers will be given:

Is the Game Worth the Candle, Dr. David B. Allman, President, American Medical Association, Atlantic City, N. J.
The Greatest Problem of Medical Education and Its Relatio to Medical Practice, Dr. Orren W. Hyman, dean, University of Tennessee College of Medicine, Memphis.
Organ Transplantation—Past, Present and Future, Dr. Davi M. Hume, chairman, department of surgery, Medica College of Virginia, Richmond.
Role of the General Physician in the Changing Picture o Tuberculosis, Dr. David T. Smith, chairman, departmen of bacteriology, Duke University School of Medicine Durham, N. C.

Two panel discussions are planned: "Recent Advances in Modern Methods of Diagnosis and Therapy" and "Medical and Surgical Aspects of Chest Diseases," moderated by Drs. Hume and Smith, respectively. The annual dinner is scheduled for May 13, 7:30 p. m. Exhibits, a golf tournament, a ladies' program, and a president's reception are arranged, and facilities for fishing will be available. For information write Dr. Samuel M. Day Jr., Secretary, Florida Medical Association, P. O. Box 2411, Jacksonville 1, Fla.

University News.—The department of medicine of the University of Miami School of Medicine has received a grant of $75,000 from the Squibb division of Olin-Mathieson, for clinical cancer chemotherapy studies over a three-year period. A special unit is being set up in Jackson Memorial Hospital to handle the transition from laboratory to clinical testing.

ILLINOIS

Annual State Medical Meeting in Chicago.—The 118th annual meeting of the Illinois State Medical Society will be held May 20-23 at the Hotel Sherman, Chicago. The president's address by Dr. Lester S. Reavley, Sterling, on May 21, will be followed by the Annual Address in Medicine, "The Place of Oral Hypoglycemic Agents in the Management of Diabetes," given by Dr. Alexander Marble, Boston, and the Annual Address in Surgery, "Hypertension—Drugs and Surgery," by Dr. Keith S. Grimson, Durham, N. C. The following out-of-state participants in the general sessions are listed: Drs. Morton D. Leigh, Los Angeles; Everett L. Pirkey, Louisville, Ky.; Nelson W. Barker, Rochester, Minn.; Francis Fralick, Ann Arbor, Mich.; Harry Bakwin and Anthony C. Cipollaro, New York City; Jerome Glaser, Rochester, N. Y.; Clyde L. Randall, Buffalo; Oscar B. Hunter Jr. and Capt. Norman Lee Barr, M.C., U. S. N., Washington,

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

D. C.; James D. Weaver, Erie, Pa.; and William B. Parsons Jr., Madison, Wis. A public relations dinner May 20 will feature Dr. F. J. L. Blasingame, General Manager, A. M. A., speaking on "It's Your AMA." Symposiums, panel discussions, special luncheons, exhibits, and a ladies' program are planned. The annual dinner will be held May 21, 7 p. m.

Chicago

Medical History Lecture.—Dr. Esmond R. Long, emeritus professor of pathology, Henry Phipps Institute, University of Pennsylvania, Philadelphia, will present the final in a second series of 10 lectures on the history of surgery and related sciences at the International College of Surgeons Hall of Fame, Chicago, May 13. Dr. Long's subject will be "Historical Facts About Morgagni, Rokitanski and Virchow, Pathologists."

Appoint Otolaryngology Department Chairman.—Dr. J. Allan Weiss, associate professor of otolaryngology at Chicago Medical School, has been appointed professor and chairman of the department of otolaryngology. He succeeds Dr. Maurice H. Cottle, who will remain with the school as professor of otolaryngology. Dr. Cottle resigned the department chairmanship in order to devote more time to research. Dr. Weiss, a native of Chicago, is attending otolaryngologist at Michael Reese and Cook County Hospitals.

University News.—H. J. Rogers, Ph.D., of the bacterial physiology division, National Institute for Medical Research (Medical Research Council), London, England, arrived in the United States in mid-March to work for three months in the laboratory of Dr. Albert Dorfman, department of pediatrics, University of Chicago.——Dr. Ian H. Wood, assistant director, The Walter and Eliza Hall Institute of Medical Research, Royal Melbourne Hospital, Melbourne, Australia, presented "The Etiology of Liver Disease in Australia" at the University of Chicago department of medicine April 10.

KENTUCKY

Annual Senior Day.—The fourth annual Senior Day program, sponsored by the Kentucky State Medical Association with the cooperation of the Jefferson County Medical Society and the University of Louisville School of Medicine was held in Louisville April 21. The program featured Dr. Louis M. Orr, vice-speaker of the A. M. A. House of Delegates, as dinner speaker. Dr. Edward B. Mersch, Covington, president, Kentucky State Medical Association, spoke at the noon session. Dr. Richard G. Elliott, II, Lexington, was chairman of the program.

MASSACHUSETTS

Dr. Warren Honored.—Friends of Dr. Sheilds Warren honored him at a dinner in Boston Feb. 26 on the occasion of his 60th birthday. They have established the Shields Warren Fund of Boston University, the income of which is to be used to elevate standards of scholarship and teaching, by the creation of "distinguished professorships" bearing his name.

NEW MEXICO

Annual State Medical Meeting in Albuquerque.—The 76th annual meeting of the New Mexico Medical Society will be held in the Civic Auditorium, Albuquerque, May 14-16. A clinical-pathological conference, May 14, will be moderated by Dr. Charles R. Beeson. Three panel discussions are scheduled:

Diagnosis and Management of Anemia, moderated by Dr. Matthew H. Block, Denver.
Management of the Acutely Traumatized Patient, Dr. Rupert B. Raney, Los Angeles.
Management of the Geriatric Patient, Dr. Thomas P. Findley Jr., Augusta, Ga.

The program lists the following guest speakers: Drs. Elmer Belt, Los Angeles; Alston Callahan, Birmingham; Alan L. Frankel, Albuquerque; Max S. Sadove, Chicago; and Kinsey M. Simonton, Rochester, Minn., as well as Drs. Block, Findley, and Raney. Dr. Gunnar Gundersen, President-Elect, American Medical Association, will present "Changing Concepts in Medical Education" at a luncheon May 15. Specialty luncheons and movie sessions are arranged. Registration fee is $10. For information write Dr. Stuart W. Adler, New Mexico Medical Society, 221 Central, N. W., Albuquerque, N. M.

NEW YORK

Annual Health Conference.—Health officials representing the Soviet Union, India, and Africa will speak at one of the two general sessions at the 54th annual Health Conference of the New York State Department of Health in Rochester. The four-day conference will start June 9. The speakers will participate in a symposium on "International Health" at 10 a. m., June 11, at the Rochester War Memorial Auditorium. Participating will be Sir Arcot Mudaliar, M.D., vice-chancellor of the University of Madras in Madras, India; Dr. F. Cambournac, World Health Organization Regional Director for Africa; and Dr. Victor Zhdanov, vice-minister of health for Russia. Moderator will be Dr. Henry Van Zile Hyde, chief, Division of International Health, U. S. Public Health Service. The first general session of this year's conference will be devoted to "Expanding Scope and Concepts of Environmental Health." Among the speakers will be Roy J. Morton, president, American Public Health Association, and Dr. Thurman B. Givan, president, Medical Society of the State of New York.

New York City

Residency in Pediatric Oncology.—Applications for the residency from Jan. 1, 1959, to Dec. 31, 1959, in pediatric oncology at Memorial Center for Cancer and Allied Diseases in New York will be received up to July 1. This residency is approved for partial credit by the American Board of Pediatrics and is limited to the neoplastic diseases of children. Salary is $4,300 annually plus maintenance. For information write to the Director, Pediatric Service, Memorial Center for Cancer and Allied Diseases, 444 E. 68th St., New York 21.

OHIO

Dr. Mendelsohn Honored.—Dr. Harry R. Mendelsohn, Cincinnati, has received the bronze placque of the Daniel Drake award of the Southwestern Ohio Society of General Physicians. Dr. Mendelsohn was a charter member when the first group of general physicians was organized in Cincinnati in 1945, serving as the first president. He is past-secretary of the Academy of Medicine of Cincinnati, past-secretary of the staff of the Jewish Hospital, and past-secretary of the staff of Our Lady of Mercy Hospital. He was chairman of the committee of one hundred which prepared a revised disaster program for the Academy of Medicine of Cincinnati, and was deputy medical director of the disaster services of the local chapter of the American Red Cross. He is most recent past-president of the National Council of County Medical Societies' Civilian Defense Organization.

Annual Law-Medicine Institute.—Western Reserve University's Law-Medicine Center, sponsored in cooperation with the Cuyahoga County Coroner's Office, has scheduled its fifth annual Institute on Science in Law Enforcement for June 16-21 on the campus in Cleveland. Topics to be presented will include: investigating crime scenes, interrogating suspects, utilizing the scientists, handling juveniles, police administration and supervision, case problems in criminal investigation and personnel matters. Lectures and discussion leaders are selected from local police departments of Greater Cleveland, the Cuyahoga County Coroner's Office, other public officers and the University faculty. Several social events are planned. A luncheon banquet on Saturday, June 21, with presentation of certificates will close the Institute. Tuition is $75 per person. For information contact Oliver C. Schroeder Jr., Director, the Law-Medicine Center, Western Reserve University, Cleveland 6.

SOUTH CAROLINA

Annual State Medical Meeting.—The 110th annual session of the South Carolina Medical Association will be held May 13-15 at the Ocean Forest Hotel, Myrtle Beach. Dr. D. Lesesne Smith Jr., of Spartanburg, will present the president's address May 15. "Current Status of Hypnotherapy in General Practice," a presentation of Dr. William S. Kroger, Chicago, will include two films, "Hypnosis in Obstetrics" and "Hypnoanesthesia in Surgery." A clinicopathologic conference will be conducted by Drs. Eugene A. Stead, Durham, N. C., and E. Arthur Dreskin, Greenville. Papers by out-of-state speakers include the following:

Anesthesia for the Traumatic Surgical Patient, Dr. Charles R. Stephen, Durham, N. C.
Chemopallidectomy for Relief of Parkinson's Disease wi Remarks on Selection of Cases for Operation and I provements in Surgical Technique, Dr. John M. Meredit Richmond, Va.
Observations on Portal Hypertension, Dr. Nathan Womack, Chapel Hill, N. C.
Cesarean Section—Some Unusual Indications, Dr. Isado Dyer, New Orleans.
Reversible Renal Disease, Dr. Eugene A. Stead Jr., Durhar N. C.
The Bedside Diagnosis of Regular Tachycardias, Dr. E ward R. Dorney, Emory University, Ga.

Exhibits and alumni luncheon meetings are planne The annual banquet (May 14, 8 p. m.) will featur Major Gen. Leonard D. Heaton, M.C., U. S. Arm Washington, D. C., as speaker. For informatio write Mr. M. L. Meadors, Secretary, South Carolin Medical Association, 120 Cheves St., Florence, S. C

TEXAS

Name Chairman of Epidemiology Department.—D Joseph L. Melnick has been named professor o virology and epidemiology and chairman of th department of epidemiology, Baylor University Col lege of Medicine, Houston, effective July 1, 195 The department of public health and preventiv medicine will be reorganized into the departmen of epidemiology at that time. Dr. Melnick is present ly chief of the virology section, Division of Biologi cal Standards, National Institutes of Health. Prio to joining the NIH in 1956, he was on the staff o Yale University, New Haven, Conn. Dr. Melnick i chairman of the World Health Organization Exper Advisory Panel on Virus Diseases and was a co recipient of the International Award for Researc in Poliomyelitis given by the Argentinian Foundation Against Infantile Paralysis in 1949.

Dr. Reed Receives Chemistry Award.—Lester J Reed, Ph.D., research scientist in the Biochemica Institute of the University of Texas, recently received the $1,000 Eli Lilly and Company award in biological chemistry during the national meeting of the American Chemical Society. Dr. Reed was honored for his research on lipoic acid, the functions of vitamins, and the growth essentials for micro-organisms. A special symposium on the "Function of Lipoic Acid" was held April 14 at which Dr. Reed presented his award address, "Some Aspects of the Chemistry and Function of Lipoic Acid." The award, which includes a gold medal and is sponsored by Eli Lilly and Company, Hearing Month for May. The campaign will focus on publicizing ways to prevent deafness, to rehabilitate the hard of hearing, and to alert parents to the need for early detection and prompt medical treatment of hearing loss in young children. The society reports that it is estimated there are 15 million accoustically handicapped persons in this country and that some 3 million of these are children. The extended time will allow flexibility in planning local tie-in programs in the 100 member organizations of the American Hearing Society, located in 32 states, the District of Columbia, and Canada, and more complete coverage of he campaign by volunteer staffs in the respective communities. Current projects of the society are: hearing evaluations for infants and young children; language development for preschool children; hearing testing programs for youngsters in public schools; speech therapy; lipreading; speech correction and auditory training; recruitment of and scholarships for prospective teachers and administrators in the field of hearing and speech; research in the prevention and alleviation of deafness; and stimulation of community action in rehabilitation and vocational placement of persons with a hearing loss. The American Hearing Society, founded in 1919 and now planning its 30th annual educational campaign, is a national nonprofit organization.

Otologists Meet in San Francisco.—The 91st annual meeting of the American Otological Society will be held May 17-18 at the Hotel Fairmont, San Francisco. The guest of honor, Dr. Ralph A. Fenton, Portland, Ore., will present an address, and half of the formal presentations will include invited guest authors:

Repair and Consequences of Trauma to the Stapes and Oval Window in Experimental Animals, Dr. Richard J. Bellucci and Dorothy Wolff, Ph.D., New York City.

Further Studies on the Function of the Utricular Macula, Drs. Joseph A. Sullivan, Walter Johnson, and James K. B. Smith, Toronto, Ont.

Hydro-Dynamic Origin of Aural Harmonics in the Cochlea, Dr. Juergen Tonndorf, Iowa City, Iowa.

Destructive Labyrinthotomy—A Study of the Prognosis of Postoperative Disability, Drs. Kinsey M. Simonton and Paschal A. Sciarra, Rochester, Minn.

Functional Changes in Inner Ear Deafness, Merle Lawrence, Ph.D., Princeton, N. J.

Differential Diagnosis Between Otosclerosis and Congenital Footplate Fixation, Dr. Howard P. House, Los Angeles, and Dorothy Wolff, Ph.D., New York City.

Neurological Assessment of Some Deaf and Aphasic Children, Dr. William M. Landau, Dr. Hallowell Davis, R. Goldstein, Ph.D., F. R. Kleffner, Ph.D., and S. Richard Silverman, Ph.D., St. Louis.

The Potential Value of Pressures of the Labyrinthine Fluids as Measured with an Electromanometer, Drs. Francis L. Weille, John W. Irwin, and Nelson Kiang, Boston.

For information write Dr. Lawrence R. Boies, Secretary-Treasurer, University Hospital, Minneapolis 14, Minn.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

	April 12, 1958		April 13, 1957
Area	*Paralytic Type*	*Total Cases*	Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	1	1	..
Middle Atlantic States			
New York	..	1	1
New Jersey	..	..	..
Pennsylvania	..	..	..
East North Central States			
Ohio	..	..	2
Indiana	..	..	4
Illinois	..	..	..
Michigan	..	..	2
Wisconsin	..	..	..
West North Central States			
Minnesota	..	..	..
Iowa	..	..	..
Missouri	..	..	1
North Dakota	..	..	..
South Dakota	..	..	..
Nebraska	1	1	1
Kansas	..	..	..
South Atlantic States			
Delaware	..	..	..
Maryland	..	..	..
District of Columbia	..	..	..
Virginia	..	..	1
West Virginia	..	..	..
North Carolina	..	..	..
South Carolina	..	..	..
Georgia	..	..	3
Florida	1	4	..
East South Central States			
Kentucky	..	..	..
Tennessee	..	..	3
Alabama	..	..	..
Mississippi	..	1	..
West South Central States			
Arkansas	..	..	1
Louisiana	1	1	2
Oklahoma	..	..	..
Texas	2	2	4
Mountain States			
Montana	..	1	..
Idaho	..	..	..
Wyoming	..	..	..
Colorado	1	1	1
New Mexico	..	..	..
Arizona	..	..	1
Utah	..	..	..
Nevada	..	..	..
Pacific States			
Washington	..	2	..
Oregon	..	..	1
California	2	2	5
Territories and Possessions			
Alaska	..	..	..
Hawaii	..	..	..
Puerto Rico	..	..	..
Total	9	17	33

FOREIGN

Hematologists to Meet in Rome.—The seventh congress of the International Society of Haematology will be held in Rome at the Palazzo dei Congressi Sept. 7-13. The official languages of the Congress will be English, French, German, Italian, and Spanish. The preliminary programme includes: 1. Immunohematology; 2. Hemorrhagic disorders; 3. Leukemia; 4. Anemia; 5. Nucleonics; and 6. The spleen and the reticuloendothelial system. The congress of the International Society of Blood Transfusions will be held at the same Palazzo dei Congressi Sept. 3-6. For information write the Segreteria del VII Congresso Internazionale di Ematologia, Instituto di Patologia Medica, Policlinico Umberto I, Roma (Italia).

CORRECTION

Aspergillus Ear Infection.—In the Question and Answer concerning *aspergillus ear infection* (The Journal, April 5, 1958, page 1803) in the last sentence of the answer the word creatine should read cresatin, so that this sentence reads as follows: "A 1% thymol concentration in cresatin as ear drops. . ."

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: The American medical qualification examination to be given henceforth twice a year for foreign medical graduates. Medical Schools in the United States and Foreign Countries, Sept. 23. *Final date for filing application is* June 23. Executive Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Illinois.

BOARDS OF MEDICAL EXAMINERS

Alabama: *Examination.* Montgomery, June 17-19. Sec., Dr. D. G. Gill, State Office Building, Montgomery 4.

Arkansas:* *Examination.* Little Rock, June 5-6. Sec., Dr. Joe Verser, Harrisburg.

California: *Written Examination.* San Francisco, June 16-19; Los Angeles, August 18-21; Sacramento, Oct. 20-23. *Oral Examination.* San Francisco, June 14; Los Angeles, August 16; San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

Colorado:* *Examination and Reciprocity.* Denver, June 10-11. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

Delaware: *Examination and Reciprocity.* Dover, July 8-10. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

Florida:* *Examination.* Miami, June 29-July 1. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami.

Georgia: *Examination and Reciprocity.* Atlanta and Augusta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta.

Idaho: *Examination.* Boise, July 14-16. Exec. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

Indiana: *Examination.* Indianapolis, June 18-20. Exec. Sec., Miss Ruth V. Kirk, 538 K. of P. Bldg., Indianapolis.

Iowa:* *Examination.* Iowa City, June 16-18. Exec. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines 19.

Kansas:* *Examination.* Kansas City, June 13-14. Sec., Dr. F. J. Nash, New Brotherhood Bldg., Kansas City.

Louisiana: *Examination and Reciprocity.* New Orleans, June 5-7. Sec., Dr. Edwin H. Lawson, 930 Hibernia Bank Bldg., New Orleans.

Maryland: *Examination.* Baltimore, June 17-20. Sec., Dr. Frank K. Morris, 1211 Cathedral St., Baltimore 1.

Massachusetts: *Examination.* Boston, July 15-18. Sec., Dr. Robert C. Cochrane, Room 37 State House, Boston.

Michigan:* *Examination.* Ann Arbor and Detroit, June 9-11. Sec., Dr. E. C. Swanson, 118 Stevens T. Mason Bldg., West Michigan Ave., Lansing 8.

Mississippi: *Examination.* Jackson, June 23-24. *Reciprocity.* Jackson, December. Asst. Sec., Dr. R. N. Whitfield, Old Capitol, Jackson 113.

Missouri: *Examination.* St. Louis, May 30-31. Ex. Sec., Mr. John A. Hailey, Jefferson City.

Nebraska:* *Examination.* Omaha, June. Sec., Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

New Mexico:* *Examination and Reciprocity.* Santa Fe, May 19-20. Sec., Dr. R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

New York: *Examination.* Albany, Buffalo, New York City and Syracuse, June 24-26. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

North Carolina: *Examination.* Raleigh, June 16-19. *Endorsement.* Raleigh, June 17. Asst. Sec., Mrs. Louise J. McNeill, Professional Bldg., Raleigh.

North Dakota: *Examination.* Grand Forks, July 9-11. *Reciprocity.* Grand Forks, July 12. Sec., Dr. C. J. Glaspel, Grafton.

Ohio: *Examination.* June 19-21, Sec., Dr. H. M. Platter, 21 West Broad St., Columbus 15.

Oklahoma:* *Examination.* Oklahoma City, June 3-4. Sec., Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.

Oregon:* *Examination.* Portland, July 16-17. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

Pennsylvania: *Examination.* Philadelphia and Pittsburgh, July 8-10. Acting Sec., Mrs. Marguerite G. Steiner, Box 911, Harrisburg.

South Carolina: *Examination.* Columbia, June 24-25. Sec., Dr. H. E. Jervey, 1329 Blanding St., Columbia.

South Dakota:* *Examination.* Rapid City, August 12-13. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

Texas:* *Examination and Reciprocity.* Fort Worth, June 23-25. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

Utah: *Examination.* Salt Lake City, July 9-11. Director, Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

Virginia: *Examination.* Richmond, June 12-14. *Reciprocity.* Richmond, June 11. Address: Board of Medical Examiners, 631 First St., S. W., Roanoke.

Washington:* *Examination.* Seattle, July 14-16. Administrator, Mr. Thomas A. Carter, Capitol Bldg., Olympia.

West Virginia: *Examination and Reciprocity.* Charleston, July 14-16. Sec., Dr. N. H. Dyer, State Office Bldg., No. 5, Charleston.

Wisconsin:* *Examination.* Milwaukee, July 8-10. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., 1 West Wilson St., Madison.

Wyoming: *Examination and Reciprocity.* Cheyenne, June 2 and Oct. 6. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

Alaska:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

Guam: *Subject to Call.* Act. Sec., Dr. S. F. Provencher, Agana.

Hawaii: *Examination.* Honolulu, July 14-15. Sec., Dr. I. L. Tilden, 1029 Kapiolani St., Honolulu.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: *Examination.* Juneau, Nov. 4. Sec., Dr. R. Harrison Leer, Room 204, Alaska Office Bldg., Juneau.

Connecticut: *Examination and Endorsement.* New Haven, June 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

Florida: *Examination.* Miami, June 7. Sec., Mr. M. W. Emmel, Box 340, Gainesville.

Kansas: *Examination.* Kansas City, June 3-4. Sec., Dr. R. E. Stowell, University of Kansas School of Medicine, Kansas City 12.

Oregon: *Examination.* Portland, June 7. Sec., Dr. Earl M. Pallett, Box 5175, Eugene.

South Dakota: *Examination.* Vermillion, June 6-7. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

Wisconsin: *Examination.* Milwaukee, June 7. Sec., Mr. William H. Barber, 621 Ransom St., Ripon.

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*Basic Science Certificate required.

GOVERNMENT SERVICES

OFFICE OF DEFENSE MOBILIZATION

Additions to Health Resources Advisory Committee.—Appointment of three additional members to the Health Resources Advisory Committee was announced March 27 by John S. Patterson, acting director of the Office of Defense Mobilization. The new committee members are Leo H. Bartemeier, M.D., Baltimore, Md., medical director, Seton Institute, Baltimore; John Z. Bowers, M.D., Madison, Wis., dean, University of Wisconsin School of Medicine; and George M. Fister, M.D., Ogden, Utah, private practice, regent, University of Utah. The committee, composed of leaders in the health professions from outside the government, advises the Office of Defense Mobilization director on health matters relating to defense mobilization programs. Chairman of the committee is Dr. Elmer Hess, Erie, Pa.

NAVY

Retirements.—Capt. James R. Sayers, M. C., a native of Waukita, Okla., was placed on the retired list of Naval officers on April 1, 1958, after completing more than 28 years of service.

Capt. Leonard E. Skilling, M. C., native of Chicago, was placed on the retired list as of April 1, having reached the age for statutory retirement.

VETERANS ADMINISTRATION

Personal.—Dr. Saul Fortunoff, director, professional services, VA Hospital, Altoona, Pa., has been appointed manager of the VA Hospital at Dwight, Ill., succeeding Dr. Warren L. Fleck, who retired Feb. 28. The hospital has 215 beds for general medical and surgical patients.

PUBLIC HEALTH SERVICE

Reduction of Poliomyelitis Cases Last Year.—The Morbidity and Mortality Weekly Report of the U. S. Public Health Service, released April 4, shows a reduction of poliomyelitis in 9,287 cases (62.4%) between 1957-1958 and 1956-1957. The reduction for paralytic poliomyelitis was 68.7%, and the reduction for paralytic cases by quarters was as follows: April to June, 57.2%; July to September, 75.2%; October to December, 60.4%; and January to March, 56.8%. The greatest reduction took place during the height of the poliomyelitis season, namely 75%. Although there has been a decrease in the total number of paralytic cases there has been, in general, an increase in the proportion of paralytic to nonparalytic cases reported. The decrease in the proportion of nonparalytic and unspecified poliomyelitis cases reported might be ascribed in part to more caution in diagnosing nonparalytic poliomyelitis.

New Assignments for Medical Directors.—The Public Health Service has announced a series of changes among medical directors assigned to the regional offices of the Department of Health, Education, and Welfare. The changes become effective July 1.

Dr. Francis J. Weber, medical director, Region 8, with headquarters in Denver, Colo., has been appointed chief of the new PHS Division of Radiological Health in Washington, D. C. Dr. Michael Pescor, at present medical director of Region 7, with headquarters in Dallas, Texas, will become medical director of the Denver office. Dr. Richard Boyd, medical director of Regions 1 and 2, stationed in New York City, will assume the same position in the Dallas office.

Dr. Harald M. Graning, medical director of Region 5, in Chicago, will move into the New York City position. Dr. Arthur B. Price, now on loan to the Bureau of Old-Age and Survivors Insurance, Social Security Administration, Baltimore, will become the medical director of the Chicago office.

The medical directors of other regions are Drs. Eugene Gillis, Region 3, Charlottesville, Va.; Will H. Aufranc, Region 4, Atlanta, Ga.; Lewis H. Hoyle, Region 5, Kansas City, Mo.; and Charles F. Blankenship, Region 9, San Francisco.

The medical directors in the regional offices of the Department of Health, Education, and Welfare direct Public Health Service programs of grants and technical assistance and other relationships with the states and territories that comprise each region.

Congress Authorizes New Indian Hospitals.—A total of $1,450,000 was appropriated by Congress for the construction of a new 75-bed Indian hospital at Shiprock, N. Mex., which will serve about 14,000 Indians of the Navajo tribe. Construction is expected to start during the summer.

The Shiprock hospital is one of four new major Indian health medical facilities authorized by Congress. The others will be at Gallup, N. Mex.; Sells, Ariz.; and Kotzebue, Alaska. The facility at Gallup will be the first Indian hospital to be located there; the other three will replace obsolete, crowded buildings inadequate for modern medical service.

DEATHS

Allen, Jacob Porter, Williamsburg, Ohio; Cincinnati College of Medicine and Surgery, 1894; died in the Brown County Hospital, Georgetown, Dec. 19, aged 86.

Anderson, Charles Lee ⊕ San Jose, Calif.; Emory University School of Medicine, Atlanta, Ga., 1928; fellow of the American College of Physicians; veteran of World War II; associated with O'Connor Hospital and San Jose Hospital, where he died Feb. 21, aged 54, of dissecting aneurysm of the aorta and arteriosclerosis.

Angear, Benjamin Horace Smith, St. Petersburg, Fla.; Illinois Medical College, Chicago, 1900; at one time practiced in Sublette, Ill., where he served as mayor; died in the Illinois Masonic Home in Sullivan, Ill., Jan. 28, aged 86, of acute coronary occlusion.

Antell, Leon ⊕ New York City; Long Island College Hospital, Brooklyn, 1916; member of the American Academy of Pediatrics; associated with Beth David Hospital and the Hospital for Joint Diseases; died March 3, aged 67, of coronary thrombosis.

Ash, Arthur F. ⊕ Weehawken, N. J.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1901; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; associated with St. Mary's Hospital in Hoboken, Margaret Hague Maternity Hospital, and the Christ Hospital in Jersey City, where he died March 9, aged 80, of cerebral thrombosis and arteriosclerotic heart disease.

Barton, Edward Williams Jr., Temple City, Calif.; Stanford University School of Medicine, San Francisco, 1937; veteran of World War II; served on the staffs of the Collis P. and Howard Huntington Memorial Hospital in Pasadena and the Garfield Hospital in Monterey Park; died in the Veterans Administration Hospital, Los Angeles, Feb. 25, aged 51, of cerebrovascular hemorrhage.

Blumgarten, Aaron Samuel ⊕ New York City; Columbia University College of Physicians and Surgeons, New York City, 1908; fellow of the New York Academy of Medicine; veteran of World War I; for many years associated with the Lebanon Hospital, where he was past-president of its medical board, and the Lenox Hill Hospital; author of "A Textbook of Materia Medica, Pharmacy and Therapeutics" and "A Textbook of Medicine"; died March 13, aged 71.

Boggs, John Waldo E., Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1904; veteran of World War I; served on the staff of St. Luke's and Children's Medical Center; died Feb. 15, aged 77, of bronchopneumonia.

Bond, Benjamin Joseph ⊕ Winter Haven, Fla.; Emory University School of Medicine, Atlanta, 1932; veteran of World War II; associated with the Winter Haven Hospital; surgeon for the Seaboard Airline Railroad; died Feb. 28, aged 50, of coronary occlusion.

Bryant, Charles Henry, Tiverton, R. I.; Jefferson Medical College of Philadelphia, 1904; health officer for the town and school physician; veteran of the Spanish-American War; examining physician for draft boards during World War I; past-president of the Rhode Island Public Health Association; served on the staff of the Truesdale Hospital in Fall River, Mass.; died Feb. 28, aged 81, of coronary infarction.

Brzozowski, Grover Stanislaus, San Diego, Calif.; Louisville (Ky.) Medical College, 1907; member of the American Trudeau Society; died Feb. 22, aged 71, of acute coronary occlusion, arteriosclerotic cardiovascular disease, and pulmonary emphysema.

Campbell, Marsden Douglas, Mapleton Depot, Pa.; Jefferson Medical College of Philadelphia, 1904; died in the J. C. Blair Memorial Hospital, Huntington, Feb. 20, aged 77, of arteriosclerosis.

Campbell, William Murphy ⊕ Weatherford, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1890; member of the American Academy of General Practice; in 1955 was honored when the name of Parker County Hospital was changed to Campbell Memorial Hospital; died March 8, aged 98.

Cashin, John Emerson, University City, Mo.; Hospital College of Medicine, Louisville, Ky., 1893; veteran of World War I; formerly associated with the Veterans Administration in Omaha, Neb., St. Louis, and Jefferson Barracks, Mo.; died in St. Louis County Hospital Feb. 28, aged 87, of myocardial infarction, and pulmonary edema.

⊕ Indicates Member of the American Medical Association.

Chisolm, Robert Patrick ⊕ Selma, Ala.; Medical College of Alabama, Mobile, 1893; died in the Baptist Hospital Jan. 6, aged 87.

Cook, Walter, Santa Ana, Calif.; University of Louisville (Ky.) Medical Department, 1910; for many years practiced in Pisgah, Iowa; died in Orange Feb. 5, aged 91.

Cranston, Clyde John ⊕ Wakeman, Ohio; Western Reserve University School of Medicine, Cleveland, 1924; veteran of World Wars I and II; served on the staffs of the Fisher–Titus Memorial Hospital in Norwalk, Norwalk (Ohio) Hospital, and the Allen Hospital in Oberlin; died Feb. 24, aged 62, of coronary thrombosis.

Crawford, Robert Oliver, El Dorado Springs, Mo.; Barnes Medical College, St. Louis, 1898; served as mayor; died Jan. 26, aged 91.

Dash, George Edward ⊕ Boothbay Harbor, Maine; Eclectic Medical Institute, Cincinnati, 1905; member of the American Academy of Pediatrics; formerly on the faculty of his alma mater; formerly practiced in Cincinnati, where he was associated with the Children's Hospital, Bethesda Hospital, Children's Home, and the Catherine Booth Home and Hospital; on the staff of Miles Memorial Hospital in Damariscotta and St. Andrew's Hospital, where he died Feb. 17, aged 74.

Davidson, James H., Slater, Mo.; University of Louisville (Ky.) Medical Department, 1896; died in the Fitzgibbon Memorial Hospital in Marshall Feb. 6, aged 83, of heart disease.

Davis, David Dexter, Bennington, Vt.; Columbia University College of Physicians and Surgeons, New York City, 1919; member of the Vermont State Medical Society; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; served on the faculty of Long Island College of Medicine in Brooklyn; lecturer in surgical anatomy at the Bennington College; a member of the state board of medical registration; veteran of World War I and an officer in the Army from 1928 to 1936; served on the staffs of the Brooklyn and Cumberland hospitals in Brooklyn; chief of surgery at the Henry W. Putnam Memorial Hospital, where he died Feb. 14, aged 65, of coronary heart disease, and uremia.

Davis, Howard Wilcox ⊕ Binghamton, N. Y.; Albany (N. Y.) Medical College, 1917; veteran of World War I; past-president of the Broome County Medical Society; fellow of the American College of Physicians; attending physician, Binghamton City and Our Lady of Lourdes Memorial hospitals; consulting internist, Broome County Tuberculosis Hospital in Chenango Bridge and Binghamton State Hospital; died Feb. 23, aged 65, of a ruptured aneurysm.

Dennis, Jeptha Weldon ⊕ Auburn, Ala.; Emory University School of Medicine, Atlanta, 1927; veteran of World War II; served as college physician and director of the student health service at the Alabama Polytechnic Institute; member of the American Academy of General Practice; died in the Emory University Hospital in Atlanta, Ga., Feb. 20, aged 54, of mesenteric thrombosis.

Dorsey, Homer Ashford, Pitts, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; died Jan. 5, aged 68, of coronary thrombosis.

Elterich, Theodore Ottmar ⊕ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1923; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; clinical associate professor emeritus of pediatrics at the University of Pittsburgh School of Medicine; associated with Children's and St. Margaret's hospitals, and the Allegheny General Hospital, where he died March 2, aged 60, of carcinoma of the stomach.

Fluke, Samuel Bancroft ⊕ Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1928; fellow of the American College of Surgeons; veteran of World War I; for many years associated with the Harrisburg Hospital, where he was past-president of the staff; consulting surgeon to the Harrisburg State Hospital; died March 12, aged 62, of carcinoma of the stomach with metasteses to the lung.

Flynn, Anna Maria, Saratoga, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; formerly practiced in San Francisco; died Feb. 13.

Fortin, William Henry, Helena, Mont.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; for many years associated with the Veterans Administration, retiring Jan. 31, 1950; died Feb. 18, aged 78, of arteriosclerotic heart disease and diabetes mellitus.

Freed, Morris Albert ⊕ Philadelphia; Jefferson Medical College of Philadelphia, 1923; died March 9, aged 62.

Garber, Judith Temkin, Stockton, Calif.; Woman's Medical College of Pennsylvania, Philadelphia, 1924; associated with Stockton State Hospital; died Feb. 24, aged 62.

Gibson, Jesse Walter ⊕ Lindale, Texas (licensed in Texas, under the Act of 1907); for many years president of the school board; died Feb. 23, aged 90, of arteriosclerosis and chronic pyelomyelitis.

Giddens, Charles C., Valdosta, Ga.; Atlanta College of Physicians and Surgeons, 1907; a director of the First National Bank and the First Federal Savings and Loan Association; died in the Pineview General Hospital Feb. 15, aged 72, of cerebral hemorrhage.

Goddard, Francis Wayland, Valley Stream, N. Y.; Jefferson Medical College of Philadelphia, 1901; for many years a medical missionary in China; fellow of the American College of Surgeons; died March 15, aged 81, of coronary occlusion.

Greene, Mary Theresa, Castile, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890; an associate member of the American Medical Association; for many years served on the Castile High School Board of Education; formerly owner of the Greene Sanitarium; died in Gainesville Feb. 27, aged 91, of abdominal aneurysm with rupture.

Hamilton, Gerald Watson ⊕ Akron, Ohio; Rush Medical College, Chicago, 1924; veteran of World War II; died in the Barberton (Ohio) Citizens Hospital Feb. 26, aged 60, of an accidental gunshot wound of the left side of his chest.

Heflin, Wyatt ⊕ Birmingham, Ala.; Jefferson Medical College of Philadelphia, 1884; member of the Southern Surgical Association; died Feb. 27, aged 97, of cerebral thrombosis.

Heldring, Elsie Carrie ⊕ De Land, Fla.; Jenner Medical College, Chicago, 1907; died Feb. 24, aged 83.

Hicks, Edward A. ⊕ Troy, Mo.; Kentucky University Medical Department, Louisville, 1904; formerly county coroner; died in the Deaconess Hospital, St Louis, Feb. 8, aged 86, of arteriosclerotic heart disease.

Ho, Ly Yuen, Kansas City, Mo.; Chinese Medical College, Canton, 1895; died Feb. 28, aged 85, of heart disease.

Holman, Charles Hinds ⊕ Carrollton, Miss.; Memphis (Tenn.) Hospital Medical College, 1903; for many years county health officer; died in the University Hospital, Jackson, March 1, aged 77.

Holtzhausser, Ralph Stephen ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1921; veteran of World War I; resident physician at Stetson Hospital; on the staffs of the St. Christopher's Hospital for Children and Philadelphia General Hospital, where he died March 6, aged 60, of carcinoma of the esophagus.

Hughes, Walter Jones, Greensboro, N. C.; Meharry Medical College, Nashville, Tenn., 1918; for a time engaged in venereal disease control with the Mississippi State Board of Health and the North Carolina State Board of Health; later continued the same work with the U. S. Public Health Service; for many years physician at Bennett College; died March 2, aged 64, of a self-inflicted knife wound in his neck.

Hunt, Henry Franklin ⊕ Danville, Pa.; born in Madisonville, Tenn., Sept. 22, 1898; Vanderbilt University School of Medicine, Nashville, Tenn., 1924; specialist certified by the American Board of Pathology; founding fellow of the College of American Pathologists; past-president of the American Society of Clinical Pathologists and the Pennsylvania Association of Clinical Pathologists; member of the Society of American Bacteriologists, American Association for Study of Goiter, American Society for the Advancement of Science, and a member of Ex-Resident Physicians of Mayo Clinic; veteran of World War I; formerly served in the pathological department of the Mayo Clinic, Rochester, Minn.; for a long time member of the committee on laboratory approval for the state board of health and on the medical advisory committee to Selective Service for Pennsylvania; consulting pathologist, Northeastern Penitentiary, Lewisburg, from 1931 to 1954; for many years director of clinical laboratories and pathologist at Danville State Hospital; chief pathologist and director of clinical laboratories, from 1929 to 1954 at the Geisinger Memorial Hospital, where he was later medical director and consultant in pathology, and where he died March 4, aged 59, of pulmonary emphysema.

Kaster, Thomas Joseph ⊕ Chicago; Rush Medical College, Chicago, 1901; died in the Passavant Memorial Hospital March 8, aged 82, of broncho pneumonia and chronic myelogenous leukemia.

Kramer, Albert A. ⊕ South Bend, Ind.; State College of Physicians and Surgeons, Indianapolis, 1907; while in Butler, served as mayor; member of the American Academy of General Practice; died Feb. 20, aged 78, of arteriosclerotic heart disease.

Marks, Lewis Hart, Paoli, Pa.; Medical Department of Tulane University of Louisiana, New Orleans, 1906; died March 10, aged 74, of coronary disease.

Marquardt, Edward William ⊕ Elmhurst, Ill.; Rush Medical College, Chicago, 1901; fellow of the International College of Surgeons; helped organize the West Suburban Hospital in Oak Park; founder of the Memorial Hospital of Du Page County, where he died March 7, aged 82.

Marshall, Benjamin Joseph ⊕ Major, U. S. Army, retired, Whitfield, Miss.; born Oct. 7, 1870; Memphis (Tenn.) Hospital Medical College, 1894; veteran of World War I; entered the medical corps of the U. S. Army in 1920 and retired May 31, 1934;

for many years associated with the Mississippi State Hospital; at one time superintendent of the Mississippi School for the Blind in Jackson; died in the University Hospital in Jackson, March 8, aged 87, of cerebral arteriosclerosis with occlusion of right middle cerebral artery.

Matveeff, Natalie Ananievna, New York City; Medical Institute for Women, St. Petersburg, Russia, 1912; died Feb. 22, aged 68, of heart disease and cancer of the esophagus.

Max, Samuel ⊕ Issaquah, Wash.; Northwestern University Medical School, Chicago, 1916; died in Huntington Park, Calif., Feb. 6, aged 67, of coronary disease.

Morgenstern, David Jacob ⊕ Brooklyn; Yale University School of Medicine, New Haven, Conn., 1926; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; died in the Beth El Hospital Feb. 12, aged 61, of coronary thrombosis.

Muller, Wasily Vilhelm ⊕ Seattle; University of Oregon Medical School, Portland, 1930; died Feb. 27, aged 60.

Murray, Kenneth Merrival, Scranton, N. D.; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1911; member of the North Dakota State Medical Association; died Dec. 21, aged 78, of coronary occlusion.

Nash, John Frederick ⊕ St. Pauls, N. C.; North Carolina Medical College, Charlotte, 1914; member of the American Academy of General Practice; veteran of World War I; died March 9, aged 68.

Newlin, Gladys Wright, Falls Church, Va.; Woman's Medical College of Pennsylvania, Philadelphia, 1913; died in the Garfield Memorial Hospital, Washington, D. C., March 13, aged 67.

Nice, Franklin Mickley Jr., Hamburg, Pa.; Jefferson Medical College of Philadelphia, 1901; served as school director; associated with St. Joseph's Hospital and the Reading Hospital in Reading; died in Miami, Fla., March 1, aged 79, of carcinoma of the gastrointestinal tract.

O'Hare, Edward Sivern, Esmond, N. D.; University of Minnesota Medical School, Minneapolis, 1914; branch line surgeon for the Northern Pacific Railway; died in Tacoma, Wash., Feb. 7, aged 71, of bronchopneumonia.

Olson, Alfred Louis, Stoughton, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; veteran of World War I; formerly city health officer; died in Madison Feb. 23, aged 81, of bronchopneumonia and myelogenous leukemia.

Oster, Edwin Jurging, Cleveland; Western Reserve University School of Medicine, Cleveland, 1920; died in St. Vincent Charity Hospital Feb. 23, aged 63, of pneumonia and diabetes mellitus.

Parker, Allan Coull, Altman, N. Y.; New York Homeopathic Medical College and Hospital, New York City, 1904; died March 10, aged 81, of myocarditis and cancer of the prostate.

Pow, John Robert ⊕ Bessemer, Ala.; University of the South Medical Department, Sewanee, Tenn., 1903; served on the staff of the Birmingham Baptist Hospitals in Birmingham; died in the Spohn Hospital, Corpus Christi, Texas, Jan. 23, aged 78, of myocardial infarction.

Putnam, Claude Eugene, Oklahoma City, Okla.; Memphis (Tenn.) Hospital Medical College, 1909; veteran of World War I; formerly associated with the Indian Service; died Feb. 27, aged 78, of pneumonia.

Rabinowitz, Harold Max ⊕ Brooklyn; Cornell University Medical College, New York City, 1908; fellow of the International College of Surgeons and the American College of Surgeons; member of the Endocrine Society; consultant, Maimonides Hospital and Jewish Hospital for Chronic Diseases; died March 9, aged 71.

Ramacciotti, William Stephen ⊕ Nebraska City, Neb.; Creighton University School of Medicine, Omaha, 1932; member of the American Academy of General Practice; on the staff of St. Mary's Hospital; died March 3, aged 56, of coronary thrombosis.

Reader, Donald Richard ⊕ Minneapolis; University of Minnesota Medical School, Minneapolis, 1939; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; veteran of World War II; on the staffs of the Glenwood Hills and Homewood hospitals; consultant, State Mental Hygiene Clinic, Fergus Falls, Minn.; died Feb. 20, aged 45, of injuries received in an automobile accident.

Reese, George Hannah ⊕ Petersburg, Va.; University College of Medicine, Richmond, 1909; served on the staff of the Central State Hospital; died Feb. 14, aged 73.

Rigler, Robert I., St. Louis; American Medical College, St. Louis, 1902; died Feb. 27, aged 85.

Roberson, Noah Francis ⊕ Sparta, Ill.; University of Nashville Medical Department, 1909; on the staff of the Sparta Community Hospital; died Feb. 20, aged 86, of intracranial hemorrhage.

Roberts, Jay Gilbert ⊕ Pomona, Calif.; Rush Medical College, Chicago, 1899; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons; veteran of

World War I; on the staff of the Pomona Valley Community Hospital, where he died Feb. 21, aged 83, of carcinoma of the prostate.

Robertson, David Wilbur ⊕ Deputy, Ind.; Medical College of Indiana, Indianapolis, 1887; died in the King's Daughters' Hospital, Madison, Feb. 14, aged 95.

Robinhold, Daniel Guy, Forty Fort, Pa.; Jefferson Medical College of Philadelphia, 1900; an associate member of the American Medical Association; veteran of World War I; for many years president of the board of health of Forty Fort; organizer, director, and vice-president of the Forty Fort State Bank; associated with Nesbitt Memorial Hospital in Kingston, where he died Feb. 15, aged 84, of acute coronary occlusion.

Roles, Charles Leon, Camilla, Ga.; Emory University School of Medicine, Atlanta, 1916; member of the Medical Association of Georgia; died in Atlanta Feb. 23, aged 72, of coronary occlusion.

Rose, Edward Ernest, Huntington, W. Va.; College of Physicians and Surgeons, Baltimore, 1907; veteran of World War I; served as superintendent of the Andrew S. Rowan Memorial Home at Sweet Springs; died March 5, aged 74.

Russell, Martin Van Buren, Hot Springs National Park, Ark.; Chattanooga (Tenn.) Medical College, 1904; specialist certified by the American Board of Otolaryngology; served on the staff of the Warner Brown Hospital in El Dorado; died in St. Joseph's Hospital Feb. 18, aged 77, of coronary occlusion.

Ryland, Caius Tacitus ⊕ Lexington, Mo.; Beaumont Hospital Medical College, St. Louis, 1897; past-president of the Missouri State Medical Association and the Lafayette County Medical Society, of which he was secretary; veteran of World War I; during World War II an examiner for the Lafayette County Selective Service Board; on the staff of the Lexington Memorial Hospital; died Feb. 16, aged 83, of bronchogenic carcinoma.

Schatz, Leo Harry ⊕ Portland, Ore.; University of Oregon Medical School, Portland, 1925; died in the Holladay Park Hospital Dec. 13, aged 61, of coronary occlusion and carcinoma of the left kidney.

Schiewe, Paul Reuben, Astoria, Ore.; University of Oregon Medical School, Portland, 1945; an associate member of the American Medical Association; veteran of World War II; past-president of the Clatsop County Medical Society; on the staff of Columbia and St. Mary's hospitals; died Feb. 25, aged 37.

Schuck, Philip ⊕ St. Louis; Marion-Sims College of Medicine, St. Louis, 1897; died in the Incarnate Ward Hospital Feb. 15, aged 87.

Schwartz, Sidney ⊕ Modesto, Calif.; Stanford University School of Medicine, San Francisco, 1938; found dead in bed Feb. 3, aged 47.

Sharp, William Lowery ⊕ St. Louis; St. Louis College of Physicians and Surgeons, 1904; veteran of World War I; found dead in bed Jan. 30, aged 79.

Shaw, Frank Longfellow, Steuben, Maine; Jefferson Medical College of Philadelphia, 1887; died in the Eastern Memorial Hospital, Ellsworth, Jan. 19, aged 93, of cerebral hemorrhage.

Simonetti, Ernesto Arturo, Mount Vernon, N. Y.; Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia, Italy, 1921; member of the Medical Society of the State of New York; member of the board of health; chief cardiologist, St. Joseph's Hospital in Yonkers; cardiologist at Mount Vernon Hospital; died March 8, aged 60, of coronary thrombosis.

Smith, Herbert Gordon ⊕ Palo Alto, Calif.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; specialist certified by the American Board of Ophthalmology; veteran of World War II; for many years on the faculty of Stanford University School of Medicine in San Francisco; died Feb. 4, aged 57, of coronary thrombosis.

Squier, Beulah Loretta Mansfield, Napa, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1895; died in the Parks Victory Memorial Hospital Feb. 6, aged 87, of cerebral hemorrhage.

Stafford, George Mason Graham, Baton Rouge, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1901; veteran of the Spanish-American War; formerly coroner, and member of the school board of Rapides Parish; served as superintendent of the State Colony for the Feebleminded in Alexandria; died in the Baton Rouge General Hospital Feb. 11, aged 82, of acute congestive heart failure.

Stats, Daniel, New York City; New York University College of Medicine, New York City, 1936; specialist certified by the American Board of Internal Medicine; member of the Medical Society of the State of New York; on the staff of the Mount Sinai Hospital, where he died March 10, aged 45, of coronary thrombosis.

Stephens, Richmond ⊕ New York City; born in New Brighton, N. Y., April 27, 1890; Columbia University College of Physicians and Surgeons, New York City, 1913; specialist certified by the American Board of Orthopaedic Surgery; member of the Connecticut State Medical Society, American Orthopaedic Association, and the American Academy of Orthopaedic Surgeons; fellow of the Amerian College of Surgeons; veteran of World War I; ttending orthopedic surgeon at the Hospital for Special Surgery and the New York Hospital in New York City; consultant in orthopedic surgery, Norwalk (Conn.) General Hospital, Stamford (Conn.) Hospital, Yonkers (N. Y.) General Hospital, St. Joseph's Hospital in Stamford, Conn., Waterbury (Conn.) Hospital, and the Danbury (Conn.) Hospital; died in Newtown, Conn., March 7, aged 67, of a malignant tumor of the cecum.

Stewart, Homer Lockett ⊕ Navasota, Texas; born n Longview, Texas, Aug. 9, 1897; University of Texas School of Medicine, Galveston, 1924; fellow of the American College of Surgeons; secretary of he Grimes County Medical Society; member of the Southern Medical Association and Pan American Association of Ophthalmology; a member of the chool board; veteran of World War I; chairman or 10 years of the board of trustees for the International Organization of Odd Fellow Homes in Corsicana and Ennis; associated with Brazos Valley Sanatorium; for five years on the staff of Hurst Eye, Ear, Nose, and Throat Hospital in Longview; died an. 29, aged 60, of coronary thrombosis with infarction.

Strauss, Abraham, Philadelphia; Jefferson Medical College of Philadelphia, 1910; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; associate in dermatology t his alma mater; past-president of the Philadelphia Dermatological Society; associated with the efferson Medical College Hospital, where he died March 3, aged 70.

trock, Charles Stewart ⊕ Verbena, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 904; died in the Chilton County Hospital, Clanton, an. 24, aged 81, of pyelonephritis.

Vann, Foy ⊕ Norfolk, Va.; Medical College of Virinia, Richmond, 1905; member of the American Academy of Orthopaedic Surgeons; past-president f the Virginia Orthopedic Society; died March 15, ged 76, of carcinoma of the lung.

on Domarus, Gunter Walter Eilhard Alfred ⊕ New York City; Thuringische Landesuniversitat Mediinische Fakultat, Jena, Thuringia, Germany, 1922; member of the American Psychiatric Association; died in the Beth David Hospital Feb. 25, aged 64, f primary carcinoma of the colon, liver metastases, nd secondary anemia.

Wall, Harvey Monroe ⊕ Windsor, Mo.; Washington University School of Medicine, St. Louis, 1908; eteran of World War I; served as a member of the board of education and as city physician; a member of the board of directors and a vice-president of the Citizens' Bank of Windsor; died in the Windsor Hospital Jan. 17, aged 73, of hypertension and coronary occlusion.

Warner, George R. ⊕ Denver; Gross Medical College, Denver, 1898; died Dec. 25, aged 85, of nephritis and congestive heart disease.

Wilkins, John G., Atlanta, Ga.; Southern Medical College, Atlanta, 1898; for many years member of the city health department; died Feb. 2, aged 83, of asthmatic heart condition.

Wood, Sterling Charles, Clanton, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1917; veteran of World War I; for many years practiced in Uvalde, Texas; died in Birmingham Jan. 4, aged 62, of carcinoma of the liver and pancreas.

Woolsey, Doris Lee Surles ⊕ St. Louis; Duke University School of Medicine, Durham, N. C., 1939; interned at Baltimore City Hospital and St. Mary's Hospital in East St. Louis, Ill.; served a residency at Barnes Hospital, St. Louis; certified by the National Board of Medical Examiners; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the International College of Surgeons; instructor of clinical otolaryngology at Washington University School of Medicine; associated with McMillan and St. Joseph's hospitals; died Feb. 13, aged 44, of injuries received in an automobile accident.

Zentmayer, William, Merion Station, Pa.; born in Philadelphia Oct. 28, 1864; University of Pennsylvania Department of Medicine, Philadelphia, 1886; emeritus professor of ophthalmology at University of Pennsylvania Graduate School of Medicine in Philadelphia; an associate member of the American Medical Association and in 1916-1917 chairman of its Section on Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; member and past-president of the American Ophthalmology Society, which in 1948 awarded him the Howe Medal, and the Association for Research in Ophthalmology; member of the Philadelphia Academy of Natural Sciences, the Pennsylvania Academy of the Fine Arts, and the Ophthalmology Society of the United Kingdom; in 1945 awarded the Leslie Dana Gold Medal of the St. Louis Society for the Blind; a director of the National Society for Prevention of Blindness; consulting surgeon at Wills and St. Mary's hospitals; on the editorial board of the *A. M. A. Archives of Ophthalmology;* died March 18, aged 93, of a heart attack.

FOREIGN LETTERS

BELGIUM

Tropical Asthenia.—The incidence of tropical asthenia has increased in the Belgian Congo to an alarming degree, and its frequency is greatest in areas of greatest Europeanization. The added load on a nursing staff that is numerically always insufficient entails hurried treatments and lowered standards of patient care. This asthenia is the early stage of a complex metabolic and endocrine disturbance and is characterized by easy fatigability, general weakness, pain and extreme weariness in the extremities, feeling more tired on arising than when retiring, alternating unnatural drowsiness and insomnia, headache, vertigo, a fall in pulse pressure, anorexia, and loss of weight. The hematologic findings are usually within normal limits. Lambillon (*Journal of Bruxelles-Medical*) stated that the treatment of choice for these patients was until recently desoxycorticosterone acetate but its use in the dosage required is attended by such undesirable side-effects as edema and headache. Norandrostanolone phenylpropionate was found to bring about rapid improvement without provoking any of the side-effects observed after corticoid administration.

The Free and Controlled Medical Profession.—At the meeting of the Belgian Society for International Medical Law, Professor de Busscher stated that, as a consequence of the hasty and ill-considered institution of social insurance, many physicians are behaving like the newly rich of postwar years. This is deplorable, since good medical practice calls for respect, confidence, and esteem for the profession from the public. The physicians as a class have neither asked for nor favored this innovation which was introduced without consulting them. The correction of this situation certainly does not consist in committing a second and even worse error, namely, nationalization under which the masses would have to be satisfied with a caricature of free consultation. The speaker was opposed to all control exercised on medical practice and asked for the gradual restoration of freedom in the medical profession. He added that the laity should not allow feelings of unconscious hatred, often based on a limited personal experience, to lead them into a generally unprofitable and disastrous action. The speaker insisted that in the medical field a so-called act of omission should be judged only by a competent physician. No disguised communistic device should corrupt the free exercise of professional behavior.

Cancer of the Ear.—Guns and Minet (*Scalpel*, November, 1957) reported a series of 128 patients with cancer of the ear with a follow-up of 11 years. Of these, 105 had cancer of the external ear, 5 of the retroauricular nodes, 9 of the external auditory canal, and 9 of the middle ear. The average survival of these patients was two years. The prognosis in patients with epithelioma of the tympanum was much worse than for those with cancer of the auditory canal. The treatment, either surgical or by irradiation, is only palliative. Cancer should be considered in middle-aged patients with recurrence of ear polyps, especially if followed by otorrhea. All polyps of the tympanum should be removed and examined microscopically. Cancer of the middle ear, as well as cancer of the auditory canal, frequently begins with otorrhea. Cancer in the deepest part of the auditory canal causes early and severe pain. Deafness in these patients is mostly of the conduction type.

BRAZIL

Subtotal Gastroduodenectomy.—At a meeting of the Associação Paulista de Medicina, Dr. Oscar C. Leite and co-workers of the São Paulo Hospital dos Comerciarios described the first human patient in whom a new technique was used to restore the transit through the digestive tract after subtotal gastroduodenectomy. The intent of this preliminary report was to stimulate others to try and to evaluate this procedure. The authors believe that patients with gastric cancer, or cancer and ulcer of the upper part of the small curvature of the stomach, are the best candidates for the new operation. Their patient, a 60-year-old man, was admitted because of an epigastric burning distress and rapid loss of weight. His erythrocyte count was 2,060,000. No abdominal tumor was palpable. Roentgenograms suggested a gastric ulcer, probably malignant, causing stenosis. On operation an enlarged stomach with a mobile tumor measuring 10 by 8 cm. was found in the antrum, with invasion of the fundus and the small curvature. The tumor was isolated after intercoloepiploic separation, the pedicle of the

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The items in these letters are contributed by regular correspondents in the various foreign countries.

liver was dissected, and the pyloric artery was ligated. The duodenum was deliberately cut, the two openings being adequately protected. Transposition of the first jejunal loop through the transverse mesocolon and section of the loop 6 cm. distal to the muscle of Treitz were performed. A terminoterminal anastomosis of the duodenum and the distal jejunal loop was made. The gastric coronary artery was ligated, and the stomach was sectioned 3 cm. below the cardia with two catgut planes of suture of one-half of the stomach opening in order to narrow it to the dimension of the mouth of the proximal jejunal loop. The anastomosis was completed and the two small intestinal loops were fixed to the mesocolon.

The postoperative period was smooth, with absence of nausea and vomiting, feeding on the second day, and a very little hemobiliary drainage. On the fifth postoperative day the erythrocyte count was 4,260,000. The patient left the hospital three weeks after the operation. Before discharge, the report of an x-ray examination was as follows: Large gastrectomy with exclusion of the pyloric antrum, the angular region, and a part of the vertical portion of the stomach; gastroenteroanastomosis well permeable to the contrast medium; the opaque substance, as it reached the duodenal arc was subjected to peristaltic and antiperistaltic movements and passed to the small intestinal loops through the horizontal and the descendant portions of the duodenum. Anatomically and physiologically the duodenal arc behaved in a manner similar to that of the gastric antrum, with a slight slowing in the to and fro movement of the contrast meal. The patient did not complain of nausea, and no reflux to the stomach was observed.

Botulism.—Botulism has been identified for the first time in Brazil at Porto Alegre. Nine persons who had eaten canned fish became gravely ill with symptoms suggestive of botulism. They were treated at the municipal Hospital de Pronto Socorro, but seven died. The causative agent was suspected after bacteriological examination and culture of the canned fish and was finally identified as Clostridium botulinum type A through the use of antibotulinic specific serum rushed from the Pasteur Institute of Paris. The serum was also used for the treatment of two of the patients who recovered.

The Expulsive Stage of Labor in Multiparas.—Dr. J. Adeodate Jr. (*Anais brasileiros de ginecologia*, vol. 45, p. 83, 1958) studied the records of 1,000 consecutive deliveries of multiparas. The age of the patients, known in 905 cases, was below 18 years in 1 case, from 19 to 27 in 501, and 28 years or more in 403. The duration of the expulsive stage could be studied only in 599. Of the rest some had to be surgically delivered, some were already in the expulsive stage on admission, and in some expulsion progressed so silently that it was impossible to recognize the moment when the dilatation of the cervix was completed. The expulsive stage lasted less than 30 minutes in 438 patients (73.1%), from 30 to 59 minutes in 113 (18.9%), from 60 to 119 minutes in 36 (6.0%), and more than two hours in 12 (2.0%). The delivery was natural in 873 cases, surgically completed in 59, corrected in 59, and induced in 9. The surgical operations performed were cesarean section in 23, forceps applications in 22, pelvic extraction in 6, embryotomy in 4, version in 1, and other operations in 3. There were no maternal deaths, but fetal death occurred in 67 deliveries. In view of the fact that in more than 90% of the multiparas the expulsive stage was completed within an hour and that in more than 70% it was completed within half an hour, the author stressed that the delay of this stage in multiparas is due to fetal cephalic engagement, while in primiparas it is due to perineal resistance. A labor of more than an hour in multiparas is not a reason for extractive procedures whenever the fetal head is above the superior strait. In most patients the engagement dystocia resolves itself spontaneously, but in others the position of the fetus must be corrected.

FRANCE

Treatment of Cavitary Tuberculosis.—In *La presse medicale* (vol. 66, p. 393, 1958) Paul Veran and coworkers stated that they gave continuous and prolonged treatment with cycloserine alone in a daily dose of 1 Gm. to 60 patients with cavitary tuberculosis who had previously had a prolonged course of major antibiotics. The results proved deceptive in every respect. Improvement in the general and functional conditions was much less marked and less lasting than with the usual antibiotics. Whereas the number of positive cures were minimal (3 of 60), the number of failures and aggravations reached 70%. The slight improvement was most marked at the end of the second month, but often between the fourth and eighth months there was a return to the initial status or an exacerbation. The susceptibility of the organisms to cycloserine gradually decreases in one-half of the patients, with no possibility of correlation between the slow development of the in vitro resistance on the one hand and the usual failure of the therapy on the other. The neuropsychiatric manifestations were lessened by a constant combination with phenobarbital. There were no severe epileptic or psychic accidents. The tolerance was satisfactory in inveterate alcoholics. The changes in the electroencephalogram were more commonly seen in the patients with intolerance with neuropsychiatric disorders. The presence of electroencephalographic abnormalities was not a contraindication to treatment with cycloserine.

Action of Chlorpromazine on the Electroencephalogram.—P. Laget and co-workers (*La presse medicale* vol. 66, p. 395, 1958) studied the effects of chlorpromazine on the electroencephalogram of 30 normal infants aged from 15 days to 2½ years. The drug was given in a dosage of 2 to 5 mg. per kilogram of body weight for several days by mouth or 1 mg. per kilogram intramuscularly 90 minutes prior to taking the electroencephalogram. In 10 of the infants there was no alteration in the waking or sleeping tracing. In the remaining 20 the drug caused slight alterations in the waking tracing (in 5 a slight flattening and in 15 a moderate slowing and increase in voltage of the basic rhythm). The sleeping tracing, however presented only a slight diminution in the voltage of the slow elements. In those infants in whom some alterations in the waking tracing occurred, these were ascribed to variations in the consciousness level (depression in watchfulness or presomnolence). In no case did chlorpromazine cause abnormal elements to appear in the tracing. The authors compared these observations with the experimental data on animals and ascribed the action of the drug to its depressive effect on the activating reticular formation. The drug seems to be useful in infantile electroencephalography inducing physiological sleep with no overharge of the tracing.

NETHERLANDS

Tolerance of Fats in Hepatic Diseases.—A correlation has long been accepted between the use of fatty meals and gastrointestinal disturbances or biliary colics in patients with hepatic diseases. M. P. v. d. Grinten (*Nederlandsch tijdschrift voor geneeskunde,* vol. 102, p. 172, 1958), however, found that many patients observe no improvement after omitting fat from their diet. On the other hand a colic is almost never observed after a test meal consisting of several eggs or some olive oil. In view of these facts the author investigated the subjective tolerance and the absorption rate for butter, margarine, and olive oil in patients with various hepatic diseases. With the exception of one patient, none had any trouble after the ingestion of up to 100 Gm. of one of these fats. One patient with a total obstruction of the common bile duct complained of nausea. There appeared to be no decrease in the absorption of these fats in patients with uncomplicated cholelithiasis or in those with hepatitis as soon as the color of the stools returned to normal. Malabsorption was seen in patients with biliary obstruction, biliary fistula, and cirrhoses with obvious icterus, and in those in the early stage of hepatitis when the stools were still clay-colored. Even in the presence of a total obstruction of the biliary tract, about 50% of the fat ingested was absorbed, a fortunate circumstance for the patient's general state of nutrition in those with protracted illness. These investigations did not include all types of fats and fatty acids. In view of the present investigation, however, it seems justified to give most patients with hepatic disease a diet containing up to 100 Gm. of butter, margarine, or olive oil.

Q Fever.—Although the regular import of cows and sheep from Q fever-infected countries might be expected to give rise to a regular occurrence of this disease among patients and cattle in the Netherlands, Dekking and Zanen (*Nederlandsch tijdschrift voor geneeskunde,* vol. 102, p. 65, 1958) found that Q fever in the Netherlands is very rare among man and absent among cattle. Since 1954 more than 6,000 serum specimens of patients with atypical pneumonia were investigated for antibodies against this disease. Until 1956 all these reactions were negative. In the last three months of that year, however, three patients, all living and working at Rotterdam, were found with serologic evidence of Q fever. The source of these infections, the first detected in this country, remained obscure. One patient might have been infected by sheep, but neither the sheep nor the shepherds showed any antibodies in their serum. The second patient, a slaughterhouse-worker, might have been infected by British, Yugoslav, or Hungarian cattle, but only three of 193 workers at the same slaughterhouse had antibodies in their serum. The third patient might have been infected in Switzerland. No contact in time, food supply, or social activity could be established between these three patients. In the same period, 150 sheep serums and 595 cattle serums from different sources in the Netherlands were investigated. All reactions were negative or only faintly positive for Q fever.

SWITZERLAND

New Compound Against Leprosy.—A new treatment for leprosy was tested on 167 patients in Nigeria by T. F. Davey (*Leprosy Review,* January, 1958). It was BDPT (4 butoxy-4'dimethylaminodiphenyl thiourea) and appeared to combine freedom from toxic side-effects with a high therapeutic effectiveness. In a dose of 25 to 40 mg. per kilogram of body weight, its activity is as great as that of the sulfones and sometimes surpasses it. After 32 months of observation there was no evidence of the development of drug resistance. Drug hypersensitivity and psychosis were not encountered. On the basis of the experience so far, BDPT is considered to be the drug of choice when an alternative is needed to the sulfones. It can be combined safely with both sulfones and isoniazid and is particularly valuable in treating children. For large scale use, however, something more is needed than high therapeutic activity and lack of toxicity. The dose of BDPT is relatively large, and, apart from its inconvenience, this adds to the cost of treatment. When given twice weekly the results, though often adequate, are not generally as good as when daily treatment is given. For these reasons BDPT is not applicable to many situations. A drug with such outstanding qualities should, however, be within the reach of patients everywhere, particularly those in whom sulfones give poor results.

UNITED KINGDOM

Financing the Health Service.—A sounder financial future for the National Health Service as a result of the increased contribution was forecast in the House of Commons during a debate on the National Health Service Contributions Bill. Mr. Walker-Smith, Minister of Health, said that though the contributor would pay more he would get good value. Much of the increase is primarily a reflection of inflationary tendencies in the economy as a whole. There was a gratifying increase in the number of new hospitals and extensions. In spite of economic difficulties the amount of money which could be made available for capital works is increasing. The cost of operating hospitals accounted for about 54% and drugs for about 10% of all Health Service expenditures. For 1958-1959 the estimated cost of drugs was $207 million, or more than twice the amount in the initial year of the service. Efforts have been made to influence the prescribing habits of physicians and to control the prices of manufacturers.

Dr. Summerskill (Socialist Opposition) said the bill showed the administrative ineptitude of the government and that a minister should satisfy himself that the heavy spending services were using money to the best advantage before being panicked into demanding further sums from the poorest people in the country. She attacked the drug houses in 1956 because she felt there was an abuse of the health service. In that year the average cost of a prescription rose from 64 to 77 cents. It had now risen to 84 cents. She inveighed against the high-powered salesmanship which induces physicians to prescribe and patients to demand expensive proprietary drugs for which there is a cheaper equivalent. Mr. Houghton (Socialist) urged that to meet the growing health service burden there should be a "butchery on the roads" tax on motorists, an extra tax on heavy smokers to stop them in their headlong rush towards cancer, and an "over-eating" tax, to be levied on expensive meals at restaurants and hotels, for those who overeat, largely at the taxpayers' expense. In three months 177 persons in London did not collect the spectacles made for them at a cost to the National Health Service of $798.

Infected Eggs.—Attention was again drawn to the dangers of infection from using imported processed egg (*Monthly Bull. Min. Health Lab. Serv.* 17:36, 1958). Large quantities of spray-dried and liquid egg are imported from China, Holland, and Australia. Of 20,000 samples analyzed, 5 to 29% were found to be infected with Salmonella thompson, Salmonella typhimurium, Salmonella paratyphi B, and other pathogenic species of Salmonella. A close correlation between the numbers of strains of each species isolated from processed eggs and the numbers causing human salmonellosis was observed. The frequent occurrence of Sal. thompson in imported egg was reflected in a high incidence of human enteritis due to this organism, which was present in the Chinese and Australian eggs. This species was rarely seen in imported processed egg during World War II, when most of it was imported from the United States, and where this organism is uncommon. The presence in Chinese eggs of Sal. paratyphi B raises a public health problem. It is not present in hens or ducks and can only occur in egg products as a result of human contamination. Many outbreaks of paratyphoid in Great Britain have been traced to the consumption of synthetic cream. Although not made from processed eggs here is every opportunity for infection to be conveyed from the latter to a cream mix in an unhygienic bakery or catering establishment. The frequency of human salmonellosis has doubled in the last few years. This might be reduced by the pasteurizing of egg products at the source or before distribution, as is done in Poland, where infection from processed egg is unknown.

Penicillin Dust and Penicillin Resistance.—The proportion of penicillin-resistant strains of Staphylococcus pyogenes var. aureus is increasing among carriers in hospital who are not receiving penicillin. This is usually explained by postulating a free interchange of organisms between the treated patients and these carriers. This presupposes that the penicillin-resistant organism is able to replace the naturally occurring penicillin-sensitive strains. Gould (*Lancet* 1:489, 1958) considers that this explanation is most unlikely. He showed that penicillin dust is widely distributed in the environment of a hospital using it. The amount recovered in different parts of the building varies but is greatest nearest those rooms where penicillin is handled or administered, as in the pharmacy, the wards, and the outpatient departments. Leakage from the vial during puncturing, clearing of air bubbles and froth from syringe and needles, and escape of spray when syringes are being washed frequently occur. Other sources of contamination are the insufflation of wounds and topical application. Air is thus contaminated directly by droplet nuclei from droplets atomized from syringes and the like and indirectly by the raising of dried spilled penicillin as dust. Gould recovered 35 mcg. of penicillin per 100 cu. ft. of air in the hospital dispensary and up to 50 mcg. from the air of the minor surgery room. He showed by air sampling that contamination readily occurs from syringes and the manipulation of penicillin.

The penicillin carrier rate of the hospital staff exceeded 60%, and all the physicians and nurses who were carriers harbored penicillin-resistant strains. Appreciable amounts of penicillin were shown to gain access to the nares of persons working in a hospital environment. Such persons are continually exposed to recontamination with staphylococci, most of which, in a hospital, are penicillinase-producing strains. Penicillin-resistant strains therefore find it easy to establish themselves and to colonize the nares of a larger number of persons in hospital than in other environments not containing penicillin dust, and where the nares of most carriers of Staph. pyogenes var. aureus are colonized with penicillin-sensitive strains. The view hat environmental penicillin is an important factor in the widespread colonization of hospital carriers with penicillin-resistant staphylococci was confirmed by observations in a penicillin factory. High concentrations of the antibiotic were found in the air and dust, and workers exposed to penicillin had as high a carrier rate of penicillin-resistant Staph. pyogenes var. aureus as hospital personnel.

Preoperative Bedside Chats.—Surgeons of the Croydon, London, groups of hospitals are making it a practice to chat with the patient the night before an operation. After various topics are talked about, the conversation veers round to the operation. The patient is told in simple words what the operation is and why it is necessary. This chat makes the patient feel that the surgeon is a friend and that he can be relied on to carry out the operation successfully. It also makes the patient feel that the surgeon has a personal interest in him. At their monthly meeting the Croydon Group Hospital Management Committee were told of the success of the scheme, which may be adopted in other hospitals.

Fourteen Cents a Visit.—One physician in the National Health Service estimated that he received 14 cents per item for service. He declined a secondhand verbal request to see a child suffering from a cold, on the ground that the child was well enough to come to his office. On receiving a note from the mother threatening to report him to the executive council he informed her that he would no longer treat the family. This meant a loss of just under $20 a year in capitation fees, but he decided it was worth it. The family of two adults and six children had been on his list for just under two years, during which time he received $33 80 in fees from the health service for all of them. In this time he rendered 100 items of service to the family, including 29 visits involving 75 miles of travel. Deducting the expenses of the practice from this amount left the doctor with 14 cents per visit or consultation.

Carbutamide in Young Diabetics.—Smellie (*Brit. M. J.* 1:553, 1958) examined the effect of carbutamide on children with diabetes of recent onset and little or no ketosis. The drug had a hypoglycemic action in the children and in two of them was associated with a reduction in the glycosuria, but such effects were only produced with relatively high and potentially dangerous blood sulfonamide levels, and evidence of sulfonamide intoxication soon developed. One child developed polyuria, polydipsia, and an erythematous rash, necessitating stopping treatment. In another child the blood platelet and leukocyte count fell, and the symptoms of diabetes returned. A third child showed a progressive clinical deterioration, in spite of a fall in the urinary glucose level. Insulin had to be reintroduced after two weeks. Smellie concluded that carbutamide has no place in the treatment of the diabetes of children, even if the disease is of recent onset.

Disease in Men in Their 60's.—Little is known about the morbidity of men in their 60's. Brown and coworkers (*Brit. M. J.* 1:555, 1958) examined the records of 1,062 men between the ages of 60 and 69, who underwent a medical examination for life insurance. Of these men 20% were free from demonstrable disease, and in nearly half of the remainder no disability was present. The incidence of disease and disability increased with age. The frequency of severe disability, defined as one which would restrict or prevent employment, rose from 10% at age 60 to 61, to 20% at age 68 to 69. The incidence of disease and disability was related to social class, which was defined according to occupation, the proportion of men with disease increasing regularly from 67% in the professional and managerial class to 86% among unskilled laborers.

The incidence of six of the eight commonest diseases (bronchitis, coronary disease, defective hearing, defective vision, hypertension, and peptic ulcer) was also related to social class. Except in the case of coronary disease, which affects the professional classes more than others, the incidence of disease increased with the lowering of the social scale. The incidence of chronic bronchitis was the same in all ages and in all social groups in the nonsmokers, but in the smokers it increased with the lowering of the social class, being over twice as much in laborers as in the professional group. An attempt was made to assess fitness for full-time employment. By the 66th year 75% of the men were still doing full-time work and in the 70th year 50%, financial need being the overriding reason for this. The proportion considered medically unfit for work was 10% for the whole decade, 15% for those above retirement age (65 to 69), and 25% of those at age 69. Chronic bronchitis was the chief cause of diability, followed by hypertension and coronary artery disease. In men over the age of 65 the extent of ill-health was closely related to occupation, being greater in those in the unskilled and semiskilled classes. It was concluded that at least 75% of the men worked beyond the age of 65 given the opportunity and a financial incentive, and that 90% were physically capable of doing so.

Brandy Prescribable Under Health Service.—A physician may prescribe brandy under the National Health Service if he thinks the patient needs it. This decision was upheld by a board of referees appointed by the Ministry of Health. They said that as the amounts required are small, a physician would not require more than a quart of brandy a year. A physician appealed against the Middlesex Executive Council's ruling that brandy is not a drug prescribable under the National Health Service. The council maintained that rectified spirit would serve the same purpose and should be used instead. The doctor concerned had given nine prescriptions, each containing a small amount of brandy. After a similar appeal in 1957 the board held that gin could be prescribed under the service.

Vaccines and the Common Cold.—J. M. Ritchie (*Practitioner* 180:356, 1958) reported that over a period of about 20 years a series of autogenous vaccines given to sufferers from chronic colds without encouragement and on their insistence, had appeared to give some protection. As an explanation he considered that the function of the virus might be initially to depress the resistance of the patient, giving the nasopharyngeal flora a free hand to upset the balance normally maintained. If this stage could be controlled the duration of the common cold would be cut to 24 to 48 hours of a clear nasal discharge. In the winter of 1955-1956, a series of 109 volunteers, receiving weekly doses of autogenous vaccine prepared from their saliva, was compared with a control group of 75 who received a carbolized saline solution only. The percentage of colds in the controls was six times that of the vaccinated group. It was then decided to try minimal doses of the appropriate antibiotic locally on a short-term basis at the time of invasion, the idea being to depress the activity of the nasopharyngeal flora to correspond to the assumed depression of resistance due to the virus. A series of 1,000 volunteers were so treated in the winter of 1956-1957, the controls being given an inert tablet. Tablets were given only when a patient reported the initial stages of a cold. The results were similar to those in the first experiment: the percentage of colds was seven times as high in controls as in those receiving antibiotic tablets, although the percentage of prodromal symptoms was much the same in both groups.

Respiratory Complications of Influenza.—In an analysis of 125 patients with respiratory complications of influenza, W. C. Walker and co-workers (*Lancet* 1:449, 1958) reported that Staphylococcus pyogenes was isolated in all the 6 patients with fulminating cases of pneumonia and from 9 of the 15 patients who died. Only 45% of the strains of Staphylococcus pyogenes isolated were sensitive to penicillin. Of the penicillin-resistant strains, 75% were sensitive to streptomycin, 94% to chloramphenicol, 75% to tetracycline, and all were sensitive to erythromycin. Superinfection with staphylococci occurred in 12 patients. Respiratory obstruction developed in 9 of the 125 patients. Six patients with laryngotracheitis had relatively mild obstructive features, and three—all with fulminating staphylococcic pneumonia—had almost total obstruction of the trachea and bronchi. The six with mild cases all recovered without tracheotomy, but this was performed in two of the three with severe cases, and undoubtedly saved life. Tracheotomy is preferable to repeated bronchoscopy. The authors believe that corticosteroids have no place in the routine treatment of the respiratory complications of influenza. When severe asthma or adrenal insufficiency coexists it is rational to use them, and when the patient has been receiving them for some other condition it is important to increase the dosage during the period of stress. Three deaths occurred among the 42 patients with bronchitis and bronchiolitis and 12 among the 69 with pneumonia.

Occupational Mortality.—The Registrar General's Supplement on Occupational Mortality, based on the 1951 census, just published, indicates that tuberculosis, syphilis, cancer of the stomach, bronchitis, and pneumonia all show a steady mortality gradient rising from a low death rate in social class 1 (professional) to a high rate in class 5 (unskilled workers). The same is true of cancer of the lung for men and of cancer of the cervix uteri for women. The converse holds true for poliomyelitis in both sexes, coronary disease in men and cancer of the breast in women. Diseases which appear to have no relation to social grouping include nephritis among men and vascular lesions of the central nervous system and coronary disease among women. There is one interesting exception to the general rule that maternal death rates rise steadily from class 1 to class 5. This is that farmers' wives appear to have a relatively high risk of dying from diseases of pregnancy and childbirth—a tendency not present to the same extent in the wives of farm laborers. Coal miners have exceptionally high standardized mortality ratios (S. M. R.) from cancer of the stomach and exceptionally low ratios for cancer of the lung and poliomyelitis. Printers and bookbinders have an apparently high death rate from leukemia. Shop owners have relatively greater mortality than their assistants from coronary disease and suicide, but the assistants die more often from tuberculosis. On the whole, physicians fare pretty well. Their S. M. R. was 89, compared with 106 for 1930 to 1936. They had a relatively high ratio for coronary disease (159), but this was not much higher than that for ministers of religion (152) and for lawyers (121). Much has been made of poliomyelitis as an occupational hazard of physicians. Their S. M. R. for this disease was 800, or eight times as many deaths as expected from this cause, but lawyers had seven deaths from poliomyelitis instead of only one expected, so there was little to choose between the two professions. This will take a little explaining on the part of the epidemiologists and illustrates the dangers of rushing into print on the basis of a few figures. Diseases in which physicians had a high S. M. R. included psychoses (200), suicide (226), cirrhosis of the liver (240), and cholelithiasis and cholecystitis (250).

Yttrium-90 and Hypophysectomy.—A method is described by G. A. Edelstyn and co-workers (*Lancet* 1:462, 1958) for destroying the pituitary gland completely by surgical hypophysectomy followed by intrasellar irradiation with the oxide of Yttrium-90 (Y^{90}) in wax. Surgical hypophysectomy was performed. When as much of the gland as possible had been removed the fossa was packed with 7.5 to 10 mc. of Y^{90} mixed with dental impression wax. Of 25 patients with advanced mammary carcinoma so treated, 20 survived operation and 16 were greatly improved. Of the five patients who died postoperatively, four were aged 60 or more, and three had severe pulmonary involvement preoperatively. All but one (94%) of those with blood-borne metastases improved.

Adult Scurvy.—Eleven patients (10 men and 1 woman) with adult scurvy seen between 1951 and 1957 were reported by R. H. Cutforth (*Lancet* 1:454, 1958). All but one were living alone. A history of deficient vitamin C intake was obtained in every case. The presenting symptoms were pain and stiffness in the legs, anorexia, and lethargy. Bruising was the most characteristic sign. Typical scorbutic lesions of the gums were seen in only one patient, but only four had any teeth. Nine were anemic, and in six the hemoglobin level was less than 55%. There was no correlation between the severity of the anemia and the degree of extravasation of blood into the tissues. Ascorbic acid, in doses of 600 to 700 mg. a day, was given to all the patients. Five of them received a standard ward diet, ascorbic acid, and no other treatment. The remaining six were also given ferrous sulfate and vitamin B complex. The symptoms and signs improved promptly. All the anemic patients, whether on ascorbic acid alone or on vitamins B and C with iron, responded at the same rate, and there seemed to be little difference between the two groups.

WORLD HEALTH ORGANIZATION

Health Protection for Air Travelers.—The number of air travelers on scheduled flights throughout the world increased from 2,500,000 in 1937 to 90 million in 1957. This tremendous growth and the fact that aircraft now carry up to 100 passengers may soon overtax the facilities at many international airports, including sanitary equipment, according to the WHO Expert Committee on Sanitation of International Airports. In regard to airports, the International Sanitary Regulations, as set up by WHO, refer expressly to such quarantinable diseases as smallpox, cholera, and yellow fever, and deal with safe water supplies, disposal of waste, and the control of insects, rats, and other disease carriers. WHO also recommended improving measures at international airports for the control of other diseases carried by food, water, or insects. Air passengers must be given the best possible hygienic protection, but the committee recognized that the health of crew members is even more important for safety in flight. It is difficult to replace crews en route, and if their health is not protected by all possible means, particularly in regard to illness with sudden onset such as food poisoning and dysentery, not only does the risk of delays in flight arise but also that of emergency landings and, consequently, of hazards to the passengers.

Only rarely do rats board an aircraft, but, if they do, they can gnaw through aluminum and puncture plastic tubing in a frantic search for food and water, and they have been known to gnaw through wires on aircraft. There is plenty of justification for going to great trouble and expense to keep them out of airports and aircraft, but it is not an easy task, for rats can jump 2 ft. vertically, burrow 2 ft. into the ground, climb smooth pipes up to 3 in. in diameter, and travel along horizontal wires. The necessity of a thorough search for rat nests can be seen from the fact that nesting rats have been found in hollow runway markers.

CORRESPONDENCE

HISTORY OF PATIENT WITH SPONTANEOUS REMISSION OF DIABETES

To the Editor:—A dramatic remission of the symptoms and signs of diabetes mellitus with severe ketosis was reported in a woman, aged 68 (*J. A. M. A.* 152:1531 [Aug. 15] 1953). In the previously described episode, coma persisted for five days with impressive laboratory evidence of profound ketosis. This included hyperglycemia of 1,170 mg.%. To reverse the laboratory signs of ketosis, 1,425 units of insulin were required in the first 24 hours. On the sixth day of this episode the patient awakened without any psychic or neurological symptoms or signs other than complete amnesia for the period of unconsciousness. There were no residual signs of disease. Her general condition was that of a normal woman of 65 years. Fundoscopy gave normal findings for a patient of her age. Within one week she achieved and maintained clinical aglycosuria and normoglycemia with complete absence of any symptoms of diabetes on an equivocal dose of 10 units of insulin and a weighed diet.

The insulin therapy was discontinued five weeks after the patient's admission. At that time no stigmata of diabetes were detectable. She could eat limitless amounts of sugar and starches without her blood or urinary sugar being elevated to clinical levels. Exhaustive loading tests showed a normal tolerance for glucose. Her neurological status was free from any abnormality. Radiologic and ophthalmological examinations, measurements of steroid excretion, and reaction to insulin gave no evidence of hypophysial disease. Studies of adrenal, thyroid, hepatic, renal, and pancreatic functions yielded figures well within the normal range. From these data we had no reason to postulate a Houssay phenomenon in our patient (John, *J. A. M. A.* 85:1629 [Nov. 21] 1925; Kotte and Vonderabe, *J. A. M. A.* 114:950 [March 16] 1940; Levin, *Ann. Int. Med.* 40:1230 [June] 1954).

Evidences for other possible causes of improvement in the symptoms and signs of diabetes mellitus such as the syndrome described by Kimmelstiel and Wilson (nonspecific glomerular nephropathy), liver disease (cirrhosis), or myxedema were also lacking. The patient was discharged from the hospital Aug. 21, 1952. Because of queries from all parts of the world regarding the subsequent course of this patient and because of the prediction of a prominent authority that she would have to return to insulin within two weeks, this woman's subsequent course is presented.

This Negro woman was readmitted to the Cook County Hospital of Chicago for reevaluation in October (50 days after her first hospital stay) and in November (90 days after her first hospital stay). Her findings remained unchanged. On a diet with a glucose equivalent of 410 Gm., she continued to remain clinically aglycosuric, excreting less than 2 Gm. of glucose in 24 hours. She has remained generally well since her comatose episode four years ago. Her diet had been unrestricted since her release from the hospital in 1952. She made monthly visits to the diabetic clinic. Two years and eight months after her first hospital stay, she complained of frequency of urination and weakness (March, 1955). Glycosuria and a moderate (200 mg.%) elevation of her fasting blood sugar level were detected.

She was placed on a diet with a glucose equivalent of approximately 180 Gm. She required 30 units of protamine zinc insulin to maintain an aglycosuric and normoglycemic state. After she had used this diet and dose of insulin in October, 1955, a test of her tolerance to glucose yielded 197 mg.% of glucose in the serum while fasting, 221 mg.% 30 minutes after ingesting 100 Gm. of glucose, 240 mg.% at 60 minutes, and 272 mg.% at two hours (in contrast to 100 mg.%, 124 mg.%, 200 mg.%, and 158 mg.% in July, 1952). Serum glucose readings during the (insulin-reduced) aglycosuric status were 142 mg.% (before breakfast), 138 mg.% at 10 a. m., and 138 mg.% at 4 p. m. Other studies of the serum yielded NPN, 41 mg.%; protein, 7.2 Gm. (of which 4.3 Gm. was albumin); inorganic phosphorus, 4.3 mg.%; total cholesterol, 302 mg.%; alkaline phosphatase, 1.7 Bodansky units; icterus index, 14 units; cephalin flocculation, plus 2; thymol turbidity, 4.7 MacLagan units; and gamma globulin turbidity, 1.26 Gm.%. The radioactive iodine uptake was 16%. An ophthalmological study yielded no ocular signs of diabetes. There was a grade II atherosclerosis in the retina. The hemoglobin level was 90% with 7,100 leucocytes having a normal distribution. The urine had a specific gravity of 1.018 when clinically free of glucose. Proteinuria was reported in one analysis. There were no abnormalities in the heart on physical examination. The electrocardiogram was normal. The blood pressure was 170/100 mm. Hg. These findings were approximately unchanged in the most recent hospital checkup in January, 1957.

A less dramatic report (Harwood, *New England J. Med.* 257:257 [Aug. 8] 1957) has appeared since the first report of our patient. An adequate explanation of the marked deviation from normal physiology, subsequent apparently complete recovery and relapse into a mild, chronic diabetic state, is not at present available. It would seem that assumption of a primary disturbance in the islet physiology would be over-simplification.

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RUSSIAN STAMPS

To the Editor:—In commenting on the Russian stamp of 1956 honoring Benjamin Franklin (*J. A. M. A.* 166:1081 [March 1] 1958), Prof. Nathaniel Kleitman calls attention to the two stamps issued by Russia in 1949 honoring I. P. Pavlov (1849-1936), the great Russian physiologist. Russia has also honored other physiologists—in 1956 with a three-color 40-kopek commemorative for I. M. Sechenov (1829-1905), "Founder of Russian Physiology," and in 1957 with a brown commemorative for William Harvey (1578-1657), on the tercentennial of his death. The latter shows Harvey in the Royal College of Physicians portrait, reversed.

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JOB RESPONSIBILITY AND CORONARY ARTERY DISEASE

To the Editor:—We are heartened by both the splendid article of Pell and D'Alonzo which appeared in the Jan. 25, 1958, issue of The Journal, page 332, and the later critical comments of Dr. Russek in the March 22, 1958, issue, page 1508, if only because both sets of investigators are determined to study the possible role of job responsibility in the pathogenesis of clinical coronary artery disease.

Although we would agree with Dr. Russek's implication that occupational titles may be misleading, nevertheless, if Pell and D'Alonzo continue to find that the executive and managerial group of their company fails to exhibit a greater morbidity of clinical coronary disease than lesser paid groups, they have excellent cause indeed to absolve this higher echelon as a group from the blight of increased susceptibility to the disorder in question. Such a result would not justify, however, the conclusion that socioeconomic stress does not play an important role in clinical heart disease. This is so because the responsibility and the stress of a job can be gauged differently by the community at large and by the individual jobholder himself. It is only the latter evaluation, however, that can bear any possible relevance to the disorder under investigation.

However, as Dr. Russek has implied, we too are finding that the two possible evaluations of job responsibility are not too frequently consonant. Unfortunately, perhaps, this really means that large epidemiologic surveys in which each subject is not studied and analyzed for his own evaluation of and also his emotional reaction to his particular job or jobs may well be completely misleading. Admittedly, intimate and personal contact between investigator and a number of subjects is a tedious and irksome task, but perhaps, for conclusive results to be obtained, the actual number to be so studied need not be too large. As the eminent mathematical physicist, C. G. Darwin, observed, "In most matters concerned with probability, 3 or 4 count as small numbers, 10 as a fairly large number, and 100 as a very large number."

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MEDICAL FILM REVIEWS

Head and Neck Anatomy Series: 16 mm., color, sound. Demonstration by Harry Sicher, M.D., Loyola University School of Dentistry, Chicago. Produced in 1957 by the Medical Illustration Service of the Veterans Administration West Side Hospital, Chicago. Procurable on loan from Central Office Film Library, Veterans Administration, Washington 25.

Part 1. Superficial Structures and Boundaries of the Carotid Triangle: Showing time 21 minutes. This film is concerned with the progressive dissection of the structures superficial to the carotid triangle and the demonstration of its boundaries.

Part 2. The Carotid Triangle: Showing time 20 minutes. The boundaries of the carotid triangle are shown, and the important structures contained within are exposed.

Part 3. The Submandibular and Submental Triangles: Showing time 24 minutes. The boundaries of each triangle are exposed, and the important structures within are demonstrated.

Part 4. The Parotid Gland and Facial Nerve: Showing time 24 minutes. Included in this film is a systematic dissection, layer by layer, showing the parotid gland in its relationship to other structures, facial nerve, and its branches.

These films show excellent dissection and are well demonstrated. The photographic quality is good; however, for better understanding and orientation, more low power shots and occasional diagrammatic drawings are suggested. In the first film, the dissection was performed on the right side and the introductory diagram was of the left. This series of films is extremely valuable in undergraduate as well as postgraduate teaching and seems to cover an area in which good motion pictures are lacking. The material covered is neither too complete nor too complex for first-year medical and dental students. Therefore, for first-year students, the films could be used for review purposes after the completion of dissection. Postgraduate students in otolaryngology and dentistry could use these films for an introductory review before dissection.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Hiatus Hernia: Its Incidence and Clinical Significance. E. Hafter. German M. Month. 3:1-4 (Jan.) 1958 (In English) [Stuttgart, Germany].

The author reports on 159 men and 141 women, between the ages of 21 and 71 years, with hiatus hernia, the size of which varied from 2 to 12 cm. (¾ to 4½ in.). There was a characteristic triad of symptoms: local symptoms limited to the retroxiphoid or epigastric region, symptoms due to failure of the diaphragmatic sphincter mechanism (incontinence of the cardia), and esophageal symptoms after reflux of the gastric contents. All these symptoms depend on the patient's posture; recumbent position or raising the intra-abdominal pressure brings on the symptoms, while an upright position results in their disappearance. Roentgenologic evidence of the hiatus hernia was obtained during the expiration phase, with the patient in the recumbent position, by filling the terminal portion of the esophagus with a mixture of barium and 1% solution of carboxymethyl cellulose, 1 tsp. of which was swallowed 20 and 10 seconds before the exposure. In cases of reversible hernia, prolapse of the stomach through the hiatus should be obtained by suitable positioning of the patient or by raising the intra-abdominal pressure. In doubtful cases, the patients should be subjected to 3 methods of roentgenologic examination, i. e., in the right oblique prone position on the Bucky table, in the straight prone position on the Bucky table with epigastric compression, and in the left oblique supine head-down (Trendelenburg) position.

It was estimated that about 10% of the patients with upper abdominal symptoms, who underwent roentgenologic examination of the stomach, had hiatus hernia, as compared with 18% who had cholelithiasis and 13% who had duodenal ulcer. In most of the patients with hiatus hernia, symptoms first appeared after they had passed the age of 50 years, but the diagnosis often was made several years later. Congenital cases are known to occur. Hiatus hernia was associated with other diseases in 159 of the 300 patients; cholelithiasis was observed most frequently, but this might have been a coincidence without pathogenetic relationship. The relatively frequent association with gastrointestinal diverticulosis may have been more than coincidental.

Conservative treatment was practiced in most of the patients. It consisted of a propped-up position in bed during the night, avoidance of heavy evening meals, and taking antacids, antispasmodics, and sedatives. Most of the patients obtained relief of their complaints. Twenty-five patients in whom surgical intervention was indicated by such complications as hemorrhage and stenotic esophagitis or by severe symptoms refractory to conservative treatment were operated on. Of 19 patients in whom the thoracic approach was used, 8 became free of complaints, the condition of 5 was improved, and 6 were therapeutic failures. Of 6 patients in whom the abdominal approach was used, 5 became free of complaints and 1 was a therapeutic failure. These rather disappointing results correspond with those reported by other workers. Surgical treatment should be practiced only in exceptional cases, particularly when complications occur.

Treatment of Undulant Fever. J. T. Gost. Lancet 1:191-192 (Jan. 25) 1958 [London].

When the new antibiotic, cathomycin, was supplied to the author for treating infections resistant to penicillin, he decided to try it in undulant fever. After treating the first few patients, he realized that this antibiotic is a specific for undulant fever. Up to now cathomycin has been used in 26 patients, who have been discharged from hospital completely cured, and not one has had a recurrence. Of the 26 patients treated, 20 had a positive blood culture on admission, and the remaining 6 had a positive agglutination test. Only the 20 patients with a positive blood culture are discussed here. Undulant fever was at its height when treatment was started. During the first 5 days of treatment no change was apparent; the pyrexia continued as before, and the symptoms remained just the same; but almost always on the 5th day the pyrexia resolved by crisis, and all the symptoms (headache, insomnia, articular pain, anorexia, and sweating) disappeared. By the end of the treatment the spleen returned to its normal size and shape, no matter how large it was. No relapse occurred. The usual

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The place of publication of the periodicals appears in brackets preceding each abstract.

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dose for adults was 0.25 Gm. every 4 hours until the day after the crisis, and then every 6 hours, to a total of 18 Gm. The author feels that with cathomycin the battle against brucellosis will be won.

Hereditary Autosomal Hemorrhagic Disease with Insufficiency of Antihemophilic Globulin and Prolonged Bleeding Time. I. M. Nilsson. Nord. Med. 59:12-16 (Jan. 2) 1958 (In Swedish) [Stockholm].

Six women from 4 families presented an atypical form of inherited hemorrhagic diathesis, not sex-linked, characterized by deficiency of antihemophilic globulin and simultaneous prolonged bleeding time. Definite reduction of antihemophilic globulin in several maternal relatives was established. Intraveous treatment of the first patient with a special purified human fraction I containing antihemophilic globulin gave good normalization. The hereditary bleeding disorder in these patients is distinguishable from von Willebrand's thrombopathy and from classic hemophilia A. Observations indicate that the prolonged bleeding time depends on the absence of a plasma factor rather than on disturbances in the capillary wall.

Suction Biopsy of the Gastric Mucosa: A Report on 10 Years' Experience. J. Tomenius. Acta med. scandinav. 159:353-367 (No. 5) 1957 (In English) [Stockholm].

The author examined histologically more than 600 suction biopsy specimens of the gastric mucosa which were obtained with the aid of a specially constructed instrument from 250 ambulant patients, 2 to 3 specimens being taken in each case. The instrument was based on the principle that a small strip of the mucosa of the stomach was sucked into a chamber in which a cylindrical knife was thrust downwards to cut off the specimen. The manufacturers of the instrument made it possible to reduce its diameter to between 13 and 14 mm., i. e., to about the same diameter as that of most of the flexible gastroscopes. By attaching the biopsy instrument to such a gastroscope, it has become possible to perform the suction biopsy under visual control and to take biopsy specimens at every gastroscopic examination without risk, provided that the indications and the contraindications for gastroscopy with an ordinary flexible gastroscope have been observed. No complications with hemorrhage or other sequelae were observed in any of the 250 patients. Since the gastrobiopsy instrument is a delicate tool, all instructions concerning its cleaning must be carefully followed.

The greatest value of gastric biopsy is not in diagnosis of cancer of the stomach. Only isolated cases of tumor depend on this diagnostic method. Negative biopsy findings in patients in whom cancer is suspected should not be considered decisive. Gastric biopsy performed in a diagnostic department with reliable roentgenologic service serves, as a rule, only to confirm the diagnosis. Gastrobiopsy findings are of much greater importance in the differential diagnosis between gastritic lesions and normal mucosa. Advanced atrophy but with decreased transparency due to interstitial hypertrophy can be diagnosed only with the aid of biopsy.

The histamine secretion test has proved to be of diagnostic value when it reveals hydrochloric acid secretion values of 90 to 100 mEq. With this level of acidity, the mucosa may be considered with great probability to be normal, i. e., not to be attacked by gastritic lesions. The gastric mucosa may, however, be normal with hypersecretion; gastritis may also occur with hydrochloric acid secretion values below 90 to 100 mEq. Histological examination of the biopsy specimens revealed a normal mucosa in 3 patients with achlorhydria. Hydrochloric acid secretion values over 120 mEq. are proof of the absence of diffuse gastritis. Lowered acidity does not prove the absence of gastritis, not even in the case of achlorhydria. Roentgenologic examination does not tell whether gastritis is present.

Appreciable eosinophil infiltration of the gastric mucosa was detected by suction biopsy in 15 patients. In 2 of the 15 patients there were tumor-like structures that were interpreted at the roentgenologic examination as cancer. Gastric biopsy revealed the true nature of these structures as tumor-like eosinophil infiltrates. Thus, it became possible to spare these patients an operation which otherwise would have been considered indicated, since the roentgenograms suggested cancer.

Leukemia and Related Conditions and the Blood-Uric-Acid. R. A. Hickling. Lancet 1:175-178 (Jan. 25) 1958 [London].

The relationship between a high uric acid level of the blood and megakaryocyte-like giant cells in the bone marrow and in the tissues affected by myeloid metaplasia appears to be a reciprocal one. This is because, when a leukemia-like disease develops in a patient who has had gout for years, it is an atypical leukemia, often an "erythroleukemia," the leukocytes not reaching "leukemic" numbers, and the tissue changes are those of "megakaryocytic myelosis," sometimes with sclerosis of the bone marrow in addition to large numbers of megakaryocyte-like giant cells. This is of great importance in considering the etiology of leukemia, because few conditions are known to cause myeloid metaplasia, the essential feature of myeloid leukemia. These statements are based upon observations of the uric acid levels of the blood in 58 patients with myeloid splenomegaly. Seventeen of these patients had myeloid leukemia, 10 had polycythemia, and the remaining 31 had myeloid splenomegaly associated with osteosclerosis, myelosclerosis, megakaryocytic myelosis, and similar conditions. A high uric acid level of the blood was closely associated with the presence of large numbers of megakaryocyte-like giant cells in the bone marrow and the spleen. Blood uric acid levels may be used as a guide to the type of myeloid metaplasia present, and the gradual change among some of the conditions mentioned above, e.g., from polycythemia to megakaryocytic myelosis and from megakaryocytic myelosis to myelosclerosis may be followed by determining the uric acid levels of the blood. When a leukemia-like disorder appears in a patient who has had gout for years, the histological changes in the bone marrow and the spleen are those of megakaryocytic myelosis.

Lymphatic Leukemia: Tabulations on 2910 Cases Treated with Chemicals. J. R. Sampey. J. South Carolina M. A. 54:53 (Feb.) 1958 [Florence].

Reviewing hundreds of clinical reports published since 1949 on lymphatic leukemia, the author found data on 2,910 patients who had been treated with chemical agents. The number of patients undergoing chemotherapy is considerably in excess of this total, since many publications covered in this tabulation gave no figures on the numbers undergoing treatment. The following remission rates were achieved: with radiophosphorus, 35%; with nitrogen mustard, 50%; with triethylene melamine (TEM), 64%; with corticotropin and cortisone, 64%; with folic acid antagonists, 51%; with 6-mercaptopurine (6-MP), 64%; and with urethane, 63%. Many other chemicals have been tried, and the incidence of remissions indicates that a number of them should be given a more extensive trial.

Hereditary Spherocytosis: Important Features. A. Schrumpf. Nord. med. 59:22-26 (Jan. 2) 1958 (In Norwegian) [Stockholm].

In hereditary spherocytosis a peculiar morphologic variation of the red blood corpuscles occurs. Inheritance is dominant but not sex-linked. The 30 persons with the disease treated since 1938 all presented characteristic clinical and laboratory features. These features are as follows: The platelets are spherical in form and thicker than normal in relation to the diameter. Few cells are true spherocytes; most of them are simply thicker than normal. While the normal lifetime of erythrocytes is from 100 to 120 days, the spherocytes disappear after 8 to 15 days. When the lifetime of erythrocytes is thus reduced to one-eighth of the usual period in a quiet phase of the disease, neoformation of red blood corpuscles must be increased 8 times to compensate for the destruction. Three important but divergent clinical pictures are to be reckoned with: (1) the anemia crisis, (2) disease of the biliary tract and retention, and (3) hepatitis.

The serum iron level was normal or elevated in 13 out of 14 patients examined. Electrophoretic examination of the blood of 5 patients whose hemoglobin was the type resistant to denaturation by alkali showed a single hemoglobin component in all; the alkaline denaturation was normal in 4 patients and slightly increased in 1 patient. Coombs's test, carried out in 18 patients, gave negative results. The osmotic resistance of the red blood corpuscles was reduced except in 1 patient with hepatitis. The chief pathogenetic factor in hereditary spherocytosis is the abnormal red blood cell and not hypersplenism. The hypertrophy of the spleen is due to an increased functional demand. The consensus of opinion today is that removal of the spleen is the only effective treatment. Splenectomy was done on 23 of the patients, with no deaths. The youngest patient at the time of operation was 8 months old; the oldest was 50 years old. The operation should be performed by a surgeon skilled in the intervention. A secondary spleen should be looked for, because, if a secondary spleen is overlooked, the disease will recur. The prognosis for life saving is usually good, except for the dangerous anemia crisis which can occur. The prognosis for complete recovery is best when the spleen has been removed.

Reliability of Electrocardiographic Diagnosis of Left Ventricular Hypertrophy. A. Selzer, C. L. Ebnother, P. Packard and others. Circulation 17: 255-265 (Feb.) 1958 [New York].

The presence and degree of left ventricular hypertrophy observed at autopsy on 550 patients who had died, and from whom electrocardiograms had been obtained during life, were correlated with the electrocardiographic findings in these patients. The electrocardiographic diagnosis of left ventricular hypertrophy had been made in 108 patients in whom the tracings showed the pattern of left ventricular hypertrophy according to currently accepted electrocardiographic criteria. This diagnosis was confirmed by autopsy findings based on heart weights in 75 patients; it was considered questionable in 16 patients and was not confirmed in 17. A careful analysis of the findings in the 17 patients with normal cardiac weights was made, and it was found that in none of these was there a known cause for cardiac hypertrophy, nor was there significant cardiac disease present. Most of the patients in this group died of malignant disease and showed considerable emaciation.

The value of the 3 principal groups of electrocardiographic criteria, namely, increased voltage, prolonged ventricular activation time, and abnormalities of the ST-T part of the ventricular complex, was examined not only in the light of confirmed and false-positive diagnoses but also according to the incidence of these criteria in patients with mild, moderate, and severe left ventricular hypertrophy determined by cardiac weight. The prolonged ventricular activation time was found to be the least reliable sign, having been present in many patients with a false-positive electrocardiographic diagnosis and absent in some patients with severe hypertrophy. Increased voltage of precordial leads, the most sensitive of the criteria, was present in most of the patients. It was also, however, most frequently responsible for a false-positive diagnosis of left ventricular hypertrophy. The depression of S-T segments, and the flattening and inversion of T waves in leads showing the highest electropositive deflections, when added to the other 2 groups of criteria, materially increased the specificity of the diagnosis. However, the relationship between the extent of the electrocardiographic abnormalities and the severity of hypertrophy is only fair. It is believed that the inaccuracies in the electrocardiographic diagnosis are inherent in the method and demonstrate the fact that conventional electrocardiography registers in a rather crude way the electric forces of cardiac action, being influenced, in addition, by such extraneous factors as body build, vagaries of anatomic position of the heart, degree of insulating effect of outside structures, and probably other, as yet unknown, factors.

The findings of the study strongly suggest that presently available electrocardiographic criteria for the diagnosis of left ventricular hypertrophy appear to be moderately satisfactory. They have to be applied, however, with the understanding of their limitations; it is necessary to accept them as an expression of probability rather than as a diagnosis of left ventricular hypertrophy. The disappointing inaccuracy of electrocardiography in the field of diagnosis of early left ventricular hypertrophy is emphasized.

Aortic Stenosis of No Physiological Significance. E. W. Hancock, W. M. Madison Jr., M. H. Proctor and others. New England J. Med. 258:305-312 (Feb. 13) 1958 [Boston].

Seven men, between the ages of 51 and 67 years, were admitted to hospital with severe cardiac symptoms, including acute pulmonary edema in 2, less acute forms of congestive heart failure in 4, and intractable angina pectoris in 1. All of them were thought to have aortic stenosis as an essentially isolated valvular lesion possibly remediable by aortic valve surgery. Yet the clinical picture in each was in some respects atypical. Catheterization of the left side of the heart was performed by right-sided posterior transthoracic puncture of the left atrium with the patient in the prone position and under local anesthesia; a barbiturate and meperidine were administered as premedication. The left ventricle was catheterized with a polyethylene catheter, 40 cm. in length and 0.030 in. in internal diameter. Cardiac catheterization established the correct diagnosis, i. e., coronary artery disease with myocardial infarction in 5 patients, and mitral valve disease not clearly apparent from clinical findings in 2. Cardiac catheterization thus was of great value in avoiding ill-advised surgical intervention in these patients.

Aortic stenosis and chronic coronary artery disease may cause similar clinical syndromes of cardiac disease. Thus, patients with signs and symptoms suggestive of severe aortic stenosis may, in fact, be suffering predominantly from coronary artery disease. The presence or absence of significant aortic stenosis is objectively established by the findings of catheterization of the left side of the heart. This procedure is indicated whenever surgery of aortic stenosis is under consideration and there is uncertainty about the degree of aortic stenosis present.

Lessons from Serum Cholesterol Studies in Japan, Hawaii and Los Angeles. A. Keys, N. Kimura, A. Kusukawa and others. Ann. Int. Med. 48:83-94 (Jan.) 1958 [Lancaster, Pa.].

The authors enumerate the main points of the hypothesis about the influence of dietary fats on the development of coronary heart disease. These points are as follows: 1. In our society an endless succession of fat-loading meals is the most important etiological factor in coronary heart disease. 2. One effect of this kind of high-fat diet is hypercholesterolemia, and this is so universal that the so-called cholesterol norms are simply standards for preclinical coronary disease. Hypercholesterolemia promotes atherosclerosis. 3. Fatty meals induce changes in the coagulability and other characteristics of the blood that favor thrombosis and inhibit fibrinolysis. 4. Food fats differ in their effect on the blood cholesterol, but the fats most abundant in our [American] diet promote hypercholesterolemia.

The basic question under investigation is this: What causes the striking differences in the frequency of coronary heart disease in different populations? In an earlier report the authors presented observations of conditions in South Africa, which demonstrated that dietary fat is an important element in the remarkable differences among populations in the frequency of coronary heart disease. Now they report findings in Japan and among Japanese in Hawaii and in California. Of all countries with detailed vital statistics, Japan reports the lowest mortality rate from coronary heart disease. Coronary heart disease is fairly common among Japanese in Hawaii but very rare in Japan. Among Japanese in California it is known that coronary heart disease is the leading cause of death. The representation of coronary heart disease among Japanese patients at the Los Angeles Japanese Hospital and those observed in private practice is much the same as among Caucasians in California.

The mean percentage of calories provided by fats in the diet and concentration of beta lipoprotein-cholesterol in the serum was studied in Japanese men, aged 40 to 49 years, in several localities in Japan, in Hawaii, and in Los Angeles. Fats provided less than 10% of total calories for the farmers at Koga and slightly more for miners and clerks in Shime; the highest fat intake in Kyushu was that of physicians, who got an average of 22% of their calories from fats. In Hawaii the Japanese men of this age group averaged a little more than 30% fat calories, and in Los Angeles the average was almost 40%. Serum cholesterol was linearly related to this percentage. The Japanese, except those in Los Angeles, get a larger proportion of their calories from fish and marine invertebrates than do the Caucasians. However, among Japanese, as in the case of most of the world's populations, when the diet is increased in fats, this increase is mainly accounted for by increasing the consumption of the more saturated types of fats, as represented by beef, pork, and dairy products. While the reported findings do not constitute proof of the hypothesis that dietary fat is a major factor in the development of coronary heart disease, the theory is consistent not only with the findings comparing Japan and the United States but also with the results of the authors' studies in north and south Italy, in South Africa, in England, in Spain, in Sweden, and, most recently, in Finland. It is consistent with the findings of other investigators in Guatemala, in Israel, in India, in Nigeria, and in West Germany. So far, all investigations on populations subsisting on low-fat diets show a low incidence of atherosclerosis and coronary heart disease and a low average level of cholesterol in the blood in comparison with populations who subsist on high-fat diets.

Chlorothiazide: An Oral Diuretic. R. I. S. Bayliss, D. Marrack, J. Pirkis and others. Lancet 1:120-124 (Jan. 18) 1958 [London].

The authors report their initial experience with a new nonmercurial diuretic, chlorothiazide (6-chloro-7-sulfamyl-1,2,4 benzathiadiazine-1,1-dioxide). The response to chlorothiazide therapy was studied in 24 patients, of whom 17 had congestive cardiac failure and the remainder had edema from various causes. Of the patients with congestive cardiac failure, 11 had responded poorly to the administration of mersalyl. A daily dose of 2 Gm. of chlorothiazide produced good results (with clearing of the edema) in 14 patients; in 7 patients the results were less satisfactory, and in 3 they were poor. Chlorothiazide may be effective in patients who do not respond to mersalyl, and it enhances the response to mersalyl even in patients who have become mersalyl-resistant. Except for 1 patient who developed malaise and anorexia, no toxic effects were observed. Chlorothiazide may cause potassium depletion, particularly if continuous treatment with 2 Gm. daily is given over a long period. In refractory cases this dosage may be required and should be supplemented with 2 to 6 Gm. of potassium chloride (sufficient to maintain a normal serum potassium level). In less severe cases which respond quickly, a smaller dose of chlorothiazide (1 to 1.5 Gm. daily) may suffice, and for maintenance therapy the drug may be given intermittently on 3 or 4 days each week.

SURGERY

Stab Wound of the Aortic Arch. R. Perkins and T. Elchos. Ann. Surg. 147:83-86 (Jan.) 1958 [Philadelphia].

A 16-year-old youth was brought to the emergency room of the University of Alabama Hospital. He was conscious but apprehensive and stated that 30 minutes earlier he had been stabbed in the neck with a "switch-blade" knife. He complained of shortness of breath and sharp inspiratory pain on the left side of the chest. There was a 4-cm. laceration in the suprasternal notch which showed moderate bleeding of bright red blood, controlled by bandage. Initial treatment consisted of bilateral intravenous infusions of isotonic sodium chloride solution, followed by whole blood when this became available, nasal administration of oxygen, 3,000 units of antitetanic serum, and 0.5 cc. of tetanus toxoid. During the initial evaluation and treatment the patient became more dyspneic, apprehensive, violent, and uncooperative. Respiratory stridor developed, and the blood pressure dropped to 80/0 mm. Hg.

In the operating room the left side of the patient's chest was opened in the 4th anterior interspace, and blood and some air gushed out. It was evident that a major vessel had been lacerated, with hemorrhage initially into the mediastinum, later extending into the pleural space on the left, and that collapse had resulted from exsanguination, tension hemopneumothorax, and anoxia due to tracheal compression. The heart was in standstill, and cardiac massage was begun. The transfusion rate was increased. Further exposure was gained by splitting the sternum vertically and retracting the upper part of the anterior thoracic cage on the left. The mediastinum was a mass of blood clot and hemorrhagic fat, in the depths of which could be found an area where bright red blood was spurting. Finger pressure control was possible, but some blood loss continued during attempts to visualize the area. Initial dissection indicated laceration of the proximal innominate artery. The distal innominate artery was ligated. Some control of bleeding resulted, and it was then possible to ascertain that the laceration involved the base of the innominate artery and extended on to the aortic arch for about 1.5 cm., the total laceration being about 2 cm. long.

Complete control was secured by placement of Allis clamps as the finger was withdrawn; then a Potts clamp was applied longitudinally to exclude the laceration but not to obstruct the aorta. The laceration was repaired with continuous over-and-over everting fine silk suture. Blood clot was evacuated from the mediastinum, and the innominate veins and trachea were explored and found to be intact. Heart beat recurred spontaneously after 15 minutes, and after 30 minutes it was strong and regular. Postoperatively, the patient reacted well from anesthesia, and there was no evidence of cerebral damage. The pulse and blood pressure remained stable. A stab wound of the aorta would appear to be a more serious injury than a stab wound of the myocardium, primarily because exsanguination occurs more quickly. The authors believe that the few patients with aortic laceration who survive to reach the hospital should be salvageable by a radical surgical approach, which involves immediate thoracotomy, with control of hemorrhage, rapid replacement of blood volume, and cardiac resuscitative measures.

Colonic Replacement of Distal Esophagus and Proximal Stomach in the Management of Bleeding Varices in Children. C. E. Koop and S. R. Roddy. Ann. Surg. 147:17-25 (Jan.) 1958 [Philadelphia].

The authors describe their experience with the use of a colon transplant to replace a resected lower esophagus and upper stomach in an attempt to control bleeding from esophageal varices when other methods have failed. Several years ago they attempted such a procedure without success in a child who was near death. Five children, ranging in age from 20 months to 16 years, have since been operated on electively after hemorrhage and subsequent to at least 1 attack of bleeding. The operation was carried out through a combined thoracicoabdominal approach, the diaphragm being cut only to within 2 to 3 cm. of the esophageal hiatus because of the varicosities in that area. A segment of transverse colon, 10 to 12 cm. in length, was then selected to the left of the middle colic artery and isolated, after which continuity of the colon was reestablished by end-to-end anastomosis. [*All the patients had been prepared for operation by means of enemas and neomycin administered by mouth.*] When the colon was ready for transplantation, the diaphragmatic incision was extended to the esophagus, hemostasis obtained, and the esophagus divided 3 to 5 cm. above the esophagocardiac junction. An anastomosis between the esophagus and the proximal end of the transverse colon transplant was then carried out. The gastrohepatic ligament was divided far enough to permit resection of about 5 cm. of the stomach as measured along the lesser curvature. The open end of the proximal part of the stomach was closed in layers, leaving an unsutured area at the lesser curvature (greater curvature in 1 case) for anastomosis to the distal end of the colon transplant. A nasogastric tube was passed through both anastomoses of the stomach, with holes cut in it above each suture line. The diaphragm was then reapproximated, so that the esophageal hiatus was at the level of the midpoint of the transplant. Because of the serious nature of the underlying lesion, the procedure described must be considered to be only palliative, but it would seem to be a worthwhile addition to the management of bleeding esophageal varices.

Visual Repair of Congenital Aortic Stenosis During Hypothermia. H. Swan, R. H. Wilkinson and S. G. Blount Jr. J. Thoracic Surg. 35:139-153 (Feb.) 1958 [St. Louis].

The authors report on 8 boys and 2 girls, between the ages of 14 months and 13 years, and 1 26-year-old man with congenital obstruction to left ventricular outflow, either at the aortic valve or at subvalvular level, who were selected from 57 patients with congenital valvular or subvalvular stenosis and were operated on with the aid of general hypothermia, circulatory arrest, and open transaortic plastic revision of their stenotic lesions. Subvalvular stenosis, which was present in 3 patients, consisted of a ring or collar of firm, whitish, fibrous tissue encircling the outflow tract of the left ventricle. This ring was located from 1 to 2 cm. below the valve in each patient. The ring involved the lowest edge of the right valve cusp in 1 patient. The posteromedial attachment of these obstructing collars was across the ventricular aspect of the aortic leaflet of the mitral valve. Of great importance was the uniform participation of the valve and the valve ring in the phenomenon of poststenotic dilatation. This participation may contribute a roentgenographic contour suggesting the subvalvular location of the lesion and also permit operative exposure through the valve ring by way of the aortic incision. Valvular stenosis was present in 8 patients and was, in general, of the type 2 stenosis of the pulmonary valve. The cusps were formed, and thickened fused commissures existed. The opening in the valve in all the patients was remarkably constant, averaging about 8 mm. in diameter. In no patient was calcification present. Bicuspid valves were found in 2 of the 8 patients, and another had essentially a bicuspid valve except that the third commissure was partially formed. Incision of this incompletely formed commissure resulted in significant postoperative regurgitation. Incision into such commissures, if they are present, should be avoided.

Recommendation for surgery depended on the clinical evidence of severe stenosis associated with left ventricular hypertrophy. Mild to severe symptoms, such as episodes of syncope, exertional dyspnea, dizzy spells, excessive perspiration, and decreased exercise tolerance, were observed in 8 of the 11 patients. Three patients died, 1 on the day of operation of acute and intractable congestive failure after removal of a subaortic lesion, 1 of tracheobronchitis on the 5th postoperative day, and 1 of hemorrhage from a pseudoaneurysm at the aortic suture line on the 27th postoperative day. The results of operation in the 8 surviving patients were encouraging but not uniformly ideal. All these patients are considered to be improved, but slight to moderate aortic insufficiency exists in 4. Open operation on the congenital obstruction of the aortic valve and subvalvular stenosis is technically feasible with the aid of hypothermia, by surface immersion, and with circulatory occlusion. The operation has definite risks and should be applied, at the present time, only to selected patients. The most consistent results, in the long run, will be achieved in those with the subvalvular type of obstruction in whom the risk of creating postoperative aortic regurgitation does not exist, and if care is taken not to injure the aortic leaflet of the mitral valve, relief of the obstruction should be quite adequate. Because of the precision required in the actual operative maneuvers for the correction of congenital aortic stenosis, open direct-vision technique is an essential component of the surgical therapy for this lesion.

Studies on Adequate Protein Nutrition in Patients After Radical Gastrectomy. A. Bucko. Deutsche Ztschr. Verdauungskr. 17:275-281 (No. 6) 1957 (In German) [Leipzig].

After total gastrectomy there occurs an excessive loss of nitrogen in the feces, which leads to a negative nitrogen balance, and there is also generally an increased excretion of fats in the feces. To compensate for this loss, the protein intake of these patients must be increased. To ascertain the optimal intake of protein in patients who have undergone total gastrectomy, the author made nitrogen-balance studies in 14 patients (12 men and 2 women) after total gastrectomy. Gastrectomy had been performed more than 6 months previously on all the patients, and in some cases 6 years had elapsed since gastrectomy, the average period being 18 months. All the patients showed signs of impaired nutrition. They had lost from 2 to 39 kg. (4.4 to 85.8 lb.) in weight, an average of about 14 kg. (30.8 lb.). Three series of experiments were carried out. In the first experiment, the diet provided an average of 1.72 Gm. of protein per kilogram of body weight per day, and the patients were fed 5 times a day. In the second experiment, practically the same diet was given, except that the protein intake of 1.8 Gm. per kilogram of body weight was slightly higher and the patients were fed 10 times a day. In the third experiment, the protein intake was increased to 2.55 Gm. per kilogram of body weight, and these patients were fed 10 times a day. The nitrogen balance was ascertained in all these patients by studying the excretion of nitrogen in the urine and in the feces. The studies revealed that in patients with total gastrectomy the upper limit of optimal protein intake is 2.3 Gm. per kilogram of body weight. Animal protein should predominate over vegetable protein in a ratio of 3:1, because it is better utilized. However, such large quantities of protein are not well tolerated, even when the patients are fed 10 times a day; with only 5 meals daily such large quantities of protein cannot be given.

The Surgical Treatment of Stenotic or Regurgitant Lesions of the Mitral and Aortic Valves by Direct Vision Utilizing a Pump-Oxygenator. C. W. Lillehei, V. L. Gott, R. A. DeWall and R. L. Varco. J. Thoracic Surg. 35:154-191 (Feb.) 1958 [St. Louis].

The authors report their experience at the department of surgery of the Minnesota Medical School in Minneapolis with a pump-oxygenator for the curative treatment of aortic stenosis, aortic regurgitation, mitral stenosis, and mitral regurgitation by use of total cardiopulmonary bypass and open cardiotomy. Normal body temperature was maintained during the surgical intervention to reduce the incidence of cardiac arrhythmias and to achieve maintenance of the oxygenator blood at or a degree or 2 above the patient's body temperature which effectively controls oxygen tension during oxygenation. The unilateral posterolateral thoracotomy on the right through the bed of the 4th or the 5th rib offers excellent access to the aortic or mitral valve areas, and the good exposure afforded by use of this incision has been an important factor in the successes obtained. Occasional patients with other congenital lesions in the left side of the chest may require a bilateral anterior thoracotomy.

Retrograde perfusion of the coronary sinus in combination with the pump-oxygenator to permit visualization of the aortic valve while maintaining the myocardial blood supply was utilized in 8 patients, between the ages of 7 months and 52 years, for aortic valvuloplasty. Five of these patients with aortic valvular disease survived the operative procedure and attained excellent clinical improvement after the valvuloplasty. Two of the 3 deaths occurred in children with congenital aortic stenosis. The other failure was due to the production of aortic insufficiency in a 28-year-old patient with a severe distortion and calcification of the valve due to acquired disease. For patients with such rigid and distorted valves it is now believed to be better to relieve the stenosis by creation of a bicuspid aperture. In the other acquired lesions with less advanced destruction and a greater degree of flexibility remaining, restoration of the triangular orifice still is sought for. In all the patients operated on, the retroperfusion of the coronary sinus appeared to protect the myocardium well against anoxia. There were no instances of cardiac arrhythmia, even though a significant number of the patients had far-advanced left ventricular disease. Acetylcholine-induced asystole was used in combination with retroperfusion of the coronary sinus in 2 of the 8 patients. After commencing the perfusion of the coronary sinus, acetylcholine was injected into the retrograde catheter and provided a dry, still field while the aortic valvuloplasty was being performed. Both patients had an excellent clinical result.

Commissurotomy was performed on a 49-year-old woman with acquired calcific aortic stenosis, utilizing total cardiopulmonary bypass during only 5 minutes of complete myocardial ischemia at normal temperature. The heart continued to beat during this time, and no cardioplegic drug was used. Despite the short period of total cardiac ischemia, the method resulted in extensive myocardial necrosis, causing the patient's death 36 hours after the surgical intervention; this approach is, therefore, not recommended for aortic valve surgery. Total cardiac ischemia, even with the additional protection offered by the potassium citrate-induced asystole, proved to be a dangerous practice in hearts with advanced states of aortic valvular disease; both patients in whom this method was used died on the operating table due to the inability to restore a left ventricular beat. Acetylcholine-induced asystole with total cardiopulmonary bypass was utilized in 6 patients with aortic valvular disease and proved to be of value when the arrest interval was brief. However, a significantly greater incidence of arrhythmias occurred than when retroperfusion was used. One operative death in this group occurred in a patient in whom a more prolonged procedure was required. Current practice has been to use the acetylcholine-induced arrest in patients with congenital lesions in whom the operative repair requires less time and the myocardium generally has a greater reserve. Retrograde perfusion of the coronary sinus, combined with retrograde acetylcholine cardioplegia if needed to facilitate exposure, is the recommended procedure for all patients with advanced degrees of acquired aortic valvular disease.

A successful complete correction of primary aortic insufficiency was obtained in a 52-year-old woman with acquired calcific aortic regurgitation and stenosis, by converting the valve leaflets by suture to a bicuspid orifice and inserting a prosthetic replacement to make up for any shrinkage or loss of tissue substance. Surgical repair of pure mitral insufficiency utilizing the pump-oxygenator was performed on 5 patients between the ages of 15 and 43 years; 4 of these were subjected to an annuloplasty consisting, in part, of selective suturing of the annulus fibrosus under direct vision to reduce its circumference commensurate with the area of valvular tissue present. Insertion of a prosthetic valve leaflet was performed in the 5th patient with substantial loss of leaflet substance. Before the surgical intervention all the patients had been seriously incapacitated by severe mitral regurgitation. There has been no operative or late death. All the patients are alive and are significantly improved. The first patient, who has been followed postoperatively for more than 1 year, has not only sustained his initial gains but has continued to improve. Surgical correction of mitral insufficiency is feasible, effective, and lifesaving. Five additional patients with pure mitral stenosis associated with other complicating factors or lesions had mitral commissurotomies under direct vision during total cardiopulmonary bypass utilizing the pump-oxygenator. There was 1 operative death. The 4 survivors have been benefited significantly.

The Clinical and Physiologic Criteria for Surgical Correction of Mitral Insufficiency. J. C. Davila, R. P. Glover, P. Jumbala and others. J. Thoracic Surg. 35:206-231 (Feb.) 1958 [St. Louis].

The authors report on 7 male and 42 female patients, between the ages of 7 and 58 years, with mitral insufficiency. All 49 patients were on a medical regimen for congestive failure. The regimen consisted of administration of digitalis preparations and mercurial diuretics, provision of a low-sodium diet, and marked restriction of activity for periods averaging 7.8 years. Twenty-six patients were medically intractable, and 23 responded to medical management. Circumferential suture of the mitral valve was used to correct mitral insufficiency in 43 of the 49 patients. Nineteen patients were alive after the operation, 14 died 1 to 8 months after the operation, and 10 died within the first postoperative week. An analysis of objective and clinical findings preoperatively, at surgical intervention, and postoperatively and an analysis of the results of corrective surgery warrant the following conclusions. Pure or predominant mitral insufficiency can be corrected mechanically, provided that mobility and flexibility of the valvular area are retained. Despite satisfactory correction of the regurgitant lesion, lasting benefit cannot be expected in patients in whom myocardial contractility is destroyed by compensatory overdilatation. When valvular damage is excessive and myocardial exhaustion has supervened, surgical intervention can be of no value. If surgical treatment is to be successful in the advanced stages of the disease, means must be sought to improve myocardial function. Ligation of the vena cava below the renal veins may be of some value in this regard. Proper selection of patients should make possible the reduction of operative mortality, should eliminate late deaths, and should lead to the attainment of consistent and highly satisfactory results. Current methods of preoperative study, both clinical and objective, are inadequate to evaluate the state of the myocardium. The size of the heart as determined by x-ray examination, the degree of pulmonary hypertension, and the left ventricular end-diastolic pressure are the only parameters which correlate in any manner with the results of surgery. The clinical and operative findings, particularly the latter, are currently the most useful guide to prognosis.

Coarctation of the Abdominal Aorta: A Case Successfully Treated Surgically. F. S. Gerbasi, R. S. Kibler and A. M. Margileth. J. Pediat. 52:191-198 (Feb.) 1958 [St. Louis].

The authors report on an 11-year-old girl who since the age of 7 years had had frontal headaches which occurred about 3 or 4 times each year and which were associated with nervousness and occasional nausea. A heart murmur was noted by the family physician. A blood pressure of 180/120 mm. Hg in both arms, diminished femoral pulsations, and inability to obtain a blood pressure in either leg was revealed on examination by the cardiologist. A systolic murmur, grade 3 in intensity, was heard along the sternal border on the left and also in the posterior part of the chest on the left. A chest roentgenogram revealed rounding of the left ventricular shadow suggestive of early hypertrophy. The aortic knob was prominent. The electrocardiogram revealed depression of the S-T segment in leads V_5 and V_6. The corrected Q-T interval was 0.26. A diagnosis of coarctation of the aorta was made.

The patient was given a general anesthetic, and a left parascapular incision was made. The 4th interspace was entered, but no definite coarctation of the aorta could be seen. On palpation of the lower thoracic aorta, a thrill was felt at the aortic hiatus of the diaphragm, and it was noted that the intercostal vessels in the lower thorax were much larger than those visualized above. An oblique extension of the previous incision was made and was carried down over the 8th interspace. The lower portion of the thoracic aorta and the upper portion of the abdominal aorta were exposed. About 2 cm. caudal to the aortic hiatus the aorta became almost solid. The procedure was terminated, the patient made a rapid recovery, and 9 days later a retrograde aortogram was performed which showed a coarctation, approximately 3 cm. in length, extending from the first lumbar vertebra to about 2 to 3 cm. above the origins of the renal arteries. Considerable collateral circulation was noted between the lower intercostal and the lumbar arteries. Three weeks after the first operation the patient was reoperated on. An incision was made through the 9th intercostal space and was carried down over the anterior abdominal wall to a level 3 cm. below the umbilicus. The abdominal aorta was exposed retroperitoneally. The narrowing of the aorta was above the renal arteries and involved the celiac axis. Because of its unusual location the entire defect was bypassed, and an aortic homograft was used successfully as a shunt about the constricted area. If a replacement graft had been inserted, it would have been most difficult to anastomose the branches of the celiac axis to the graft, since these vessels were of such small caliber that the likelihood of such anastomoses remaining patent would have been small. The patient tolerated the procedure well, and the postoperative course was relatively uneventful. The blood pressure varied between 112 and 170 mm. Hg systolic and between 80 and 120 mm. Hg diastolic. Nine months after the second operation the patient was well and had been on full activity during the previous 2 months. The cardiac murmur was absent. The blood pressure was 110/70 mm. Hg in the arms, 120/80 mm. Hg in the left leg, and 95/75 mm. Hg in the right leg. Surgical correction of such lesions is the only satisfactory method of treatment.

Leiomyosarcoma of the Lung. H. Yacoubian, J. E. Connolly and R. H. Wylie. Ann. Surg. 147:116-123 (Jan.) 1958 [Philadelphia].

Leiomyosarcomas of the lung are rare. A review of the literature has revealed 12 cases, 6 of the patients being treated successfully by resection. The case presented here is the 13th case on record and the 7th in which the patient was treated successfully by operation. The patient was a 29-year-old woman who was admitted to the Bellevue Hospital chest service with a 1-week history of headache, fever, chills, and cough productive of increasing amounts of thick yellow purulent sputum. Four days prior to admission a right-sided pleuritic chest pain developed, and the patient had bright red hemoptysis. A chest film revealed diffuse haziness on the right side below the 7th rib posteriorly, radiating from the hilus and obscuring the base and costophrenic angle. In response to treatment with penicillin and Aureomycin, the fever subsided. However, although a chest film showed clearing at the base, an ill-defined shadow persisted in the region of the hilus of the right lung. On lateral chest films this shadow was seen to be located in the region of the superior segment of the lower lobe of the right lung. Bronchoscopy revealed a smooth, pink, polypoid mass measuring 1 by 1 cm., growing out of the superior segmental orifice of the lower lobe of the right lung. It was friable and bled excessively when a specimen was removed for biopsy. The biopsy report was leiomyosarcoma. Because of the proximity of this tumor mass to the upper lobe bronchus, it was elected to perform a pneumonectomy. A concomitant 4-rib thoracoplasty was done. The patient's postoperative convalescence was uneventful. Microscopic sections revealed a leiomyosarcoma. The lymph nodes in the specimen were not involved. The patient has remained well and has been free of disease 1 year after resection.

The 12 cases of leiomyosarcoma of the lung previously reported are briefly reviewed. These tumors are usually centrally located, arising in the major bronchi. In 8 of the 13 cases the tumor was accessible by bronchoscopy and arose in a main stem bronchus or in 1 of its major branches. Leiomyosarcomas seem to grow slowly and extend locally by direct continuity. They are not, however, as invasive locally as carcinomas. They metastasize late by hematogenous dissemination. Bronchoscopic biopsy should establish the diagnosis. The symptoms are primarily respiratory. Hemoptysis is more common than in carcinoma of the lung. The cure rate after resection in cases of leiomyosarcoma should be high compared with carcinoma of the lung. Exploratory thoracotomy should be done in all cases where there are no demonstrable metastases.

The Management of Perforative Carcinoma of the Colon. G. A. Donaldson. New England J. Med. 258:201-207 (Jan. 30) 1958 [Boston].

The 182 patients reviewed comprised 7.8% of all patients with carcinoma of the colon treated at the Massachusetts General Hospital over a 20-year period. *Three types of perforations are differentiated:* (1) free rupture into the peritoneal cavity; (2) local abscess formation; and (3) formation of a fistula to a hollow viscus. Largely because of the ulcerating, inflammatory nature of all these lesions, the area of disease tends to become walled off before perforation occurs. In this group 93 (51%) of the patients had a local abscess; 50 (28%) had fistula formation; and 39 (21%) had free perforation. Sixty-six per cent, or 121 patients, came to resection, and 84 of them were operated on more than 5 years ago. Resectability is influenced largely by the ability to survive a preliminary drainage or bypass operation. Operative mortality is high and is related to the type of perforation and the operative procedure performed.

This opinion is supported by the deaths among the 121 patients undergoing removal of the tumor either as a primary or as a secondary procedure. Here 12 deaths, representing a mortality of 10%, occurred at the time of the primary or definitive surgery. In the more critically ill, drainage and *exteriorization* were done, with a mortality of 25 and 38% respectively. Nine per cent of 68 patients subjected to a bypassing procedure and later to a resection succumbed to one of these operations, whereas only 5% of 41 patients died as a result of a primary removal of the tumor. Twenty-eight of 73 patients surviving resection are alive 5 years or more after surgery. The fistula group contributed 14, or 50%, of the 28 patients who survived for 5 years. Lesions in the transverse colon presented the highest salvage rate, namely, 60%. The type of primary operation chosen and the involvement of regional lymph nodes also have a bearing on 5-year salvage. The author makes suggestions on the preferred method of management of the various types of perforations in the various areas of the large intestine.

Clinical Contribution to Resection Therapy of Pulmonary Tuberculosis. H.-A. Korn. Ztschr. Tuberk. 110:133-143 (No. 3 and 4) 1957 (In German) [Leipzig].

This report is concerned with observations on 100 pulmonary resections carried out on patients with tuberculosis in the course of 2 years. Repeated resections and exploratory or repeated thoracotomies are not included in this number. Twelve of the 100 patients had bronchostenosis and atelectasis with large and inflated cavities, pulmonary destruction, and residual empyema cavities; 53 patients had caseous foci with filled cavities, caseous foci with breakdown into small cavities and surrounding tuberculous dissemination, and caseous pneumonic tuberculosis; 14 had tuberculomas (round foci of stratified structure); 4 had tuberculosis and bronchiectasis (post-tuberculosis syndrome); and 17 patients were subjected to resection *after collapse therapy had failed*, and the remaining cavities had either proved resistant to treatment or cavitation had recurred. The 100 patients included 56 women and 44 men, whose ages ranged from 13 to 51 years. In 74 of the patients the sputum contained tubercle bacilli before the operation, whereas in the remaining 26 patients the sputum was free from tubercle bacilli, but in 12 of this last group a smear from the surgical specimen yielded tubercle bacilli. In 59 of the patients the tuberculosis had been in existence for less than a year, but 17 of the patients had had tuberculosis for 5 years or more.

The extent of the resection varied; 8 patients were subjected to pneumonectomy, 57 to lobectomy, and 34 to segmental resection, and in 1 patient a wedge excision was carried out. All resections were carried out under cover of streptomycin therapy. Treatment with streptomycin was generally begun from 8 to 14 days before the operation, and it was continued after the operation, generally until an average dose of 30 Gm. had been administered. Only 1 patient died as the result of pulmonary resection 6 hours after operation; death seemed to be due to hypoxemia after pneumonectomy on the right side with a contralateral pneumothorax. Three patients had granulomas of the bronchial stump, and in 1 of these tubercle bacilli again appeared in the sputum. Two patients had recurrences in the form of early reactions; in 1 patient the recurrence took the form of a contralateral recurrence and in the other of a homolateral reactivation. Complications, such as bronchial fistulas, pleural empyema, or pulmonary embolism, were not observed in any of the patients. Proper selection of patients for pulmonary resection greatly increases the prospects of success. Patients should be prepared by a rest cure in a sanitarium, and then the most suitable time for the operation can be ascertained. Consistent postoperative therapy is also of great importance.

Heterotopic Pancreatic Tissue Involving the Stomach. N. S. Martinez, C. G. Morlock, M. B. Dockerty and others. Ann. Surg. 147:1-12 (Jan.) 1958 [Philadelphia].

A review of the literature has disclosed reports of 154 surgical cases of heterotopic pancreatic tissue involving the stomach. This report summarizes the data in 51 cases observed at the Mayo Clinic; 41 of these cases were previously unreported, thus bringing the total to 195. Heterotopic pancreatic tissue is found in patients of all age groups but most commonly in those in the 4th and 5th decades of life. The incidence is slightly greater in male than in female patients. In this series the heterotopic pancreatic tissue was purely an incidental finding in only 16 of the 51 patients; in all others the lesions were associated with clinical signs or roentgenologic manifestations or both. The condition does not have a specific symptom complex. Pyloric obstruction is sometimes produced by intermittent prolapse of the lesion through the pylorus or by proliferation of the surrounding muscle. Severe gastrointestinal bleeding occasionally occurs because of ulceration of the overlying gastric mucosa.

About three-fourths of the patients in this series showed roentgenologic changes, which were most frequently consistent with a polypoid gastric tumor. The roentgenologic demonstration of barium-filled excretory ducts, seen head on or in profile, contained within the boundaries of a small (less than 1.5 cm.) filling defect located in the antrum, justifies the diagnosis of heterotopic pancreatic tissue. The morphologic characteristics of these lesions vary with the gastric layers predominantly involved. Submucosal heterotopic masses of pancreatic tissue frequently present a nipple-like umbilicated appearance. Most lesions occur within 5 cm. of the pylorus; they are susceptible to the usual pathological changes, such as myomatous proliferation, ulceration, neoplastic changes, pancreatitis, and formation of cysts. The clinical course is usually benign, but the presence of symptoms and the roentgenologic demonstration of a lesion justify surgical excision. When the lesion is found incidentally, its removal is indicated to obtain histological confirmation of its character and to obviate development of clinical manifestations or pathological changes. The slight risk of operations in the present era justifies excision of all heterotopic masses of pancreatic tissue involving the stomach. Local excision is the most suitable operation, and subtotal gastric resection is best reserved for patients in whom the true nature of the lesion cannot be established and malignancy is suspected.

Clinicopathological Study of 94 Limbs Amputated for Occlusive Vascular Disease. P. J. Kelly, D. C. Dahlin and J. M. Janes. J. Bone & Joint Surg. 40 A: 72-78 (Jan.) 1958 [Boston].

A clinical study of 323 amputations with reference to all factors that determine the site of amputation in occlusive vascular disease included this anatomicopathological study of 94 amputated lower limbs. The amputations were performed at the Mayo Clinic between March, 1949, and April, 1951. Forty of the limbs were amputated through the thigh and 54 below the knee. These 94 extremities were dissected, and the vascular pathological changes were recorded on a sketch of the main arteries of the limb. The vessels studied included the anterior tibial, posterior tibial, and peroneal arteries, as well as the distal portions of the femoral and popliteal arteries when they were available. The vessels were carefully examined grossly by making cross sections every few millimeters. Multiple fresh frozen sections were prepared and examined microscopically. After representative sections were selected in this manner, fixed sections were made and stained with hematoxylin and eosin and with an elastic-tissue stain counterstained with van Gieson's solution. The clinical data on all the patients who had such amputations were available.

Dissection and miscroscopic examination of the 40 limbs amputated above the knee demonstrated the segmental nature of the occlusive arterial lesions in atherosclerosis obliterans. Limbs amputated above the knee that contained fresh thrombi in the femoral or popliteal arteries were clinically the most ischemic of the entire series of 94 limbs examined. Patients with diabetes mellitus who were subjected to amputation above the knee did not have fresh thrombi in the popliteal or femoral arteries. This correlates with the clinical finding that recent sudden arterial occlusion is relatively infrequent as the initiating factor for amputation in patients with both atherosclerosis and diabetes. The anterior tibial, posterior tibial, and peroneal arteries of limbs amputated for atherosclerosis obliterans showed no quantitative differences in the degree of occlusion in those amputated above the knee compared with those amputated below the knee. The old lesions of thromboangiitis obliterans may bear a strong histological resemblance to certain other thrombotic lesions, such as those secondary to emboli. The microscopic picture of thromboangiitis obliterans is not always specific, and its diagnosis requires that the pathologist be familiar with the clinical history and findings in all cases.

Fusion of the Spine for Tuberculosis in Children: A Long-Range Follow-up Study. M. Cleveland, D. M. Bosworth, J. W. Fielding and P. Smyrnis. J. Bone & Joint Surg. 40 A:91-106 (Jan.) 1958 [Boston].

The observations presented were made on 18 of 42 children, who were treated by spine fusion for tuberculosis between 1929 and 1941. None of these patients received antituberculous medication, since the period of treatment was before its discovery. Sixteen of the 18 were in poor general condition; the average age at the time of operation was 5½ years, the youngest being 1.9 years old and the oldest 12 years of age. As regards ethnic groups, there was no essential difference between one and another in recovery, given equal surgical, medical, dietary, and general physical care. Two boys died of meningitis. One of them had tuberculosis of the spine, hip, and shoulder. Both hip and shoulder were successfully fused. A solid spine fusion of adequate length was obtained. This patient disappeared from observation while in excellent condition. The authors heard of his death several years later. The other boy had extensive tuberculosis of the cervicothoracic spine with destruction from the 5th cervical to the 7th thoracic vertebra, inclusive. Fusion was done in 2 stages. Further extension of fusion was advised, but the patient was removed by his parents. He returned with paraplegia and sinuses from the spinal area and died. The 16 who survived now range in age from 18 to 36 years. Nine of them are essentially normal as judged by physical activity. Four are in excellent condition, but because of moderate kyphosis, apparent when unclothed, they cannot be considered normal. Two have considerable kyphosis which is apparent even when the patient is clothed. One has marked deformity, with great constriction of the chest and loss of abdominal as well as thoracic space. All the patients with primary lumbar involvement had excellent results.

Four of the girls married, and 2 of them have children. Two of the men are married, and both are fathers. All the children are alive and well. Social adjustments are excellent in 10 patients, good in 3, moderately limited in 2, and considerably limited in 1. The following points are stressed in the concluding summary: 1. Spine-fusion masses grow and of themselves cause minimal deformity. 2. Spine fusion can decrease or may prevent collapse of diseased vertebral bodies in a child with tuberculous spondylitis. 3. No residual pelvic effects were noted in adults as a result of removal of iliac grafts from them as children. 4. Development of kyphosis may at times be the result of fatigue-stress fracture of the fusion mass with spontaneous repair occurring unnoted. 5. Paraplegia in a child, due to vertebral tuberculosis, demands spine fusion, not laminectomy or evacuation of abscess. 6. Tuberculosis of the spine in a child adequately treated by spine fusion can result in an excellent physical status in the adult.

GYNECOLOGY & OBSTETRICS

Arias-Stella Reaction as Diagnostic Aid in Extrauterine Pregnancy. T. Frederiksen. Ugesk. læger 120:51-55 (Jan. 9) 1958 (In Danish) [Copenhagen].

In 32 patients with extrauterine pregnancy who underwent operation, scrapings from preliminary curettage of the uterus were examined histologically. Special search was made for the endometrial changes described by Arias-Stella, said to occur when there is chorion tissue somewhere in the organism. The changes are shown by the occurrence, especially focally, of glands in which some of the nuclei become large, hyperchromatic, and irregular in form. The nuclei also lose their polarity and are displaced luminally in the cells. The changes were found in 13 of the scrapings. In 6 cases there was not simultaneous decidual reaction. The number of cases in which extrauterine pregnancy could be suspected increased from 38 to 56%.

Stress Incontinence of Urine in the Female and Sling Operation. V. Hiilesmaa. Ann. chir. et gynaec. Fenniae 46:384-397 (No. 4) 1957 (In English) [Helsinki].

Seventy-three women, between the ages of 25 and 68 years, most of them parous, with stress incontinence of urine underwent a sling operation at the women's clinic of the University of Helsinki between January, 1951, and June, 1956. A flap of fascia, freed from the aponeurosis of the muscles in the abdominal wall, was utilized to form a sling which, in the fashion of a hooked finger, elevated the urethral base and the bladder neck. A combined abdominovaginal technique was used in 64 patients and a purely abdominal technique in 9. The plastic repair was done according to the Goebell-Frangenheim-Stoeckel method in 53 of the 64 patients; Aldridge's method was employed in 9 patients and Sunde's method in 2. For the purely abdominal operations the technique described by Sjövall was employed. Nineteen of the 73 patients had been operated on previously and had recurrences of stress incontinence. Prolapse of the uterus had occurred in 28 patients who had moderately severe or severe incontinence. Of the 73 patients, 2 had mild incontinence, 42 had moderately severe incontinence, and 29 had severe incontinence. Preoperative urethrocystography was performed in 17 patients and revealed abnormal widening of the urethrovesical angle varying from 150 to 180 degrees.

Obstetric trauma is the principal cause of stress incontinence in women. Operative procedures in connection with delivery were frequent (3 forceps deliveries and 9 breech deliveries with manual aid). The incontinence had started immediately after delivery in 24 patients, 3 of whom were delivered by forceps and 1 had a breech delivery with manual aid. Only 7 patients had had 5 or more deliveries, but severe incontinence was about equally frequent in women with 1, 2, or 3 children. These data suggest that the number of deliveries as such does not increase the incidence or the severity of stress incontinence, but the importance of each delivery must be evaluated in the individual patient.

Bladder lesions occurred in connection with the operation in 6 patients and a urethral lesion in 1; 5 of these patients had an abdominal operation and 2 an abdominovaginal operation. Because of the lower incidence of complications, the abdominovaginal method may be considered more favorable. There were no deaths. Sixty-nine patients were followed up postoperatively from 6 months to 5 years. Forty-six patients obtained a complete cure, 17 were improved, and 6 (about 9%) were failures.

Some Clinical Applications of Vaginal Smears in Gynaecological Endocrinology. F. Osmond-Clarke and M. Murray. Brit. M. J. 1:307-310 (Feb. 8) 1958 [London].

Periodic or daily vaginal smears were obtained from 110 patients attending the endocrine clinic of the Chelsea Hospital for Women in London, and single vaginal smears were obtained from 40 patients attending the cancer follow-up clinic of the same hospital. The vaginal smears were obtained by aspirating the secretion from the posterior fornix of the vagina. The single differential stain now used in Shorr's clinic in New York City was applied to the vaginal smears and gave satisfactory results by providing information concerning hormone activity. Like all present methods of observing ovarian function, vaginal cytology has its limitations, but it has the advantages of being simple, inexpensive, and nontraumatic and does not require the patient's admission to hospital or the use of laboratory animals. Furthermore, it permits a continuous rather than an isolated study of ovarian function. The daily percentages of each type of cell found in the vaginal smears were plotted graphically to record the functional state of the ovaries. The curve shown by the cornified cells, whose percentage varies in proportion to the amount of estrogen being utilized in the body, proved to be the most indicative of ovarian activity. Conversely, the percentage of basal cells varied with the degree of atrophy of the vaginal epithelium.

Clinically, vaginal cytology has been of value in amenorrhea to assess the degree and character of ovarian dysfunction, in the management of the menopause, and in infertility. It has also been useful as a therapeutic index for patients with ovarian agenesis treated by implantation of estrogen, for pregnant women with a history of frequent miscarriages treated by implantation of progesterone, for patients given androgen therapy to counteract the effect of excessive estrogen, and for patients given small doses of deep x-ray therapy to stimulate ovarian activity. Vaginal cytology has been of aid in detecting the presence or absence of estrogens in patients with uterine carcinoma.

PEDIATRICS

Marchesani Syndrome. J. Zabriskie and M. Reisman. J. Pediat. 52:158-169 (Feb.) 1958 [St. Louis].

The authors report on 2 siblings, a 9-year-old boy and his 6-year-old brother, with the syndrome first described by Marchesani in 1939, which consists of short stature, brachydactylia, and spherophakia, with associated myopia and glaucoma. Fourteen cases of Marchesani's syndrome in children between the ages of 9 months and 13 years, including the 4 original cases of Marchesani, have been collected from the literature. The authors' 2 patients represent the only offspring of 2 short parents who were first cousins; a maternal grandmother was short, wore glasses all her life, and had cataract extractions late in life. One of the 2 patients had evidence of infundibular pulmonary stenosis, while the other had a probable interventricular septal defect. Only 1 of the 14 previously reported patients had a cardiac murmur. There seems to be general agreement that the Marchesani syndrome represents an hereditary defect. The appearance of incomplete syndromes (forme fruste), either spherophakia with normal extremities or brachydactylia with normal eyes, suggests that mild brachydactylia represents a heterozygous intermediate, while severe spherophakia (with or without brachydactylia) represents the homozygous recessive form. The occurrence of consanguinity in several of the families reported further favors a homozygous recessive genotype.

Marchesani and later Schmid commented on the striking contrast of their cases with those of Marfan. The patient with Marfan's syndrome is tall, tending to kyphosis and scoliosis of the spine. The extremities are long with "spider fingers" (arachnodactyly). Congenital ectopia lentis and congenital cardiac and vascular defects are often present. The Marchesani syndrome and the Marfan syndrome are at opposite poles in many systemic respects, but they share similar lens defects. Marchesani postulated that there was a single defect (dystrophia mesodermalis congenita), the 2 syndromes representing the hypoplastic (arachnodactylic) and the hyperplastic (brachydactylic) variants. If Marfan's syndrome is a hypoplastic mesodermal defect, then the result of a defect in the cardiac elastic tissues would result in lesions of a "dilating" nature, i. e., insufficiency and aneurysm. In a series of 28 patients with Marfan's syndrome who died and on whom autopsies were performed, 11 had aortic cystic necrosis, 15 had aortic aneurysms, and 10 had aortic insufficiency. If one further postulated the converse for the Marchesani or hyperplastic syndrome, one would expect cardiac lesions of a stenotic nature. The pulmonary stenosis in 1 of the authors' patients is compatible with this somewhat tenuous hypothesis.

Endocardial Fibroelastosis: Angiocardiographic Studies. L. M. Linde, F. H. Adams and B. J. O'Loughlin. Circulation 17:40-45 (Jan.) 1958 [New York].

The authors report on 4 children, 2 boys and 2 girls, between the ages of 3½ months and 2 years, in whom the chronic form of primary endocardial fibroelastosis was diagnosed clinically and confirmed by autopsy in 1. Selective biplane angiocardiography, in which a 50% solution of sodium diprotrizoate (Miokon) was used as contrast medium, was performed in all patients. A striking finding was the unchanging size and contour of the left ventricle in consecutive cardiac cycles. Angiocardiographic studies performed in patients with left ventricular enlargement and left ventricular failure without endocardial fibroelastosis showed marked systolic and diastolic change in volume in the left ventricle and the left atrium. These observations indicate that the unchanging size and contour of the left ventricle in the patients with endocardial fibroelastosis were not due to heart failure or left ventricular hypertrophy. All angiographic studies in the latter patients showed prolonged retention of dye in an enlarged left ventricle, as muscular contraction was apparently impaired by a splinting action of the thickened endocardium. These findings may help in understanding the pathological physiology in endocardial fibroelastosis and may be of aid in the antemortem diagnosis of this entity.

Newly Recognized Myxoviruses from Children with Respiratory Disease. R. M. Chanock, R. H. Parrott, K. Cook and others. New England J. Med. 258:207-213 (Jan. 30) 1958 [Boston].

The studies described were designed to investigate the viral etiology of respiratory illness in infants and young children. Monkey kidney tissue cultures maintained in Eagle's basal medium were inoculated with 0.2 ml. of throat-swab fluid and incubated for 5 days at 37 C. Then, 0.2 ml. of a 0.4% guinea pig erythrocyte suspension was added, and cultures were placed at 4 C for 20 minutes. The cultures were then examined microscopically for adsorption of red cells to the monkey kidney monolayer. If adsorption (hereafter called hemadsorption) occurred, the tissue culture fluid was passed into a series of cultures for identification. The cultures that did not show hemadsorption at 5 days were fed with fresh maintenance medium and tested again at 5-day intervals for an additional 20 days. The phenomenon of hemadsorption was first described by Bogel and Shelokov.

Two new myxoviruses were isolated from children with respiratory illness by means of the hemadsorption technique and money kidney tissue culture. Type 1 hemadsorption virus was recovered from 35 children; 8 of the children were studied in hospitals, and 27 were involved in an outbreak of febrile respiratory illness in a nursery. In a single day's test of all children in the nursery, type 1 hemadsorption virus was significantly more prevalent among children who were ill, thus suggesting an etiological relation. Type 2 hemadsorption virus was recovered from 3 children hospitalized with croup. The hemadsorption viruses were distinct from types A, B, and C of the influenza virus and from other known myxoviruses. Type 2 hemadsorption virus shared a common complement-fixing antigen with Sendai virus but could not be distinguished from it by the hemagglutination-inhibition and neutralization techniques.

THERAPEUTICS

Iatrogenic Adrenal Insufficiency. A. Vermeulen and K. Vuylsteek. Belg. tijdschr. geneesk. 13:1367-1373 (Dec. 15) 1957 (In Flemish) [Leuven, Belgium].

Surgeons, realizing that treatment with corticoids generally retards cicatrization, have discontinued the administration of corticoids several days before a surgical intervention; they believe that a few injections of corticotropin will protect the patients against adrenocortical insufficiency and postoperative collapse. The seriousness of adrenocortical insufficiency that may result after treatment with corticoids is still not sufficiently appreciated. On the basis of a case history and of experimental clinical studies, the authors emphasize the following points: 1. Probably two-thirds of the patients who have been treated with prednisone or prednisolone have insufficiency of the adrenal cortex. 2. No clinical signs indicate the presence of this insufficiency, and particularly the sodium and potassium values may be completely normal. Only a functional test of the adrenal cortex will reveal the insufficiency in that there is an inadequate increase in secretion of corticoids after stimulation with corticotropin. A normal basal excretion of corticoids does not exclude the presence of a functional insufficiency, and a positive Thorn test likewise is not necessarily significant. 3. The duration and dosage of treatment with corticoids are only of secondary importance. While functional insufficiency is more likely to occur after prolonged treatment with large doses of corticoids, it has also been observed after prednisone has been given for only a week in daily doses of 20 mg. 4. The severity of the insufficiency shows great individual variations. 5. This form of latent insufficiency may persist for months or even years. 6. The adrenal cortex can be reactivated by prolonged stimulation with corticotropin.

Adrenal insufficiency should always be thought of in patients who have been treated with corticoids in the last 2 years and whenever there is a postoperative shock not explainable by other factors. Treatment with corticoids should not be interrupted before an operation; on the contrary, immediately before, during, and after the operation the dose should be increased. Reduced cicatrization is a disadvantage which certainly does not justify the extreme danger of acute adrenal insufficiency. In patients in whom latent adrenal insufficiency is suspected, one should give during an operation and also during acute infection not only corticotropin but also large doses of corticoids; antibiotics should likewise be given. To interrupt a course of corticoid therapy for 1 day during the week and administer corticotropin is of no value in the prevention of adrenal insufficiencies, and corticotropin stimulation is generally of too short a duration to have any effect. Every course of corticoid therapy should be terminated with a prolonged course of corticotropin, and administration of corticotropin should begin during the last several days of treatment with corticoids. Experimental studies have indicated that slow-acting corticotropin should be given for at least 7 days.

Nitroglycerin and Other Nitrites in the Treatment of Angina Pectoris: Comparison of Six Preparations and Four Routes of Administration. J. E. F. Riseman, G. F. Altman and S. Koretsky. Circulation 17:22-39 (Jan.) 1958 [New York].

The comparative therapeutic value of 6 different nitrites, namely, glyceryl trinitrate (nitroglycerin), erythrol tetranitrate, mannitol hexanitrate, pentaerythritol tetranitrate, triethanolamine trinitrate biphosphate, and sodium nitrite, when administered by the oral, sublingual, subcutaneous, and percutaneous routes, was studied in 20 men and 14 women with angina pectoris due to coronary artery disease, most of whom were 51 years of age or over. This was done by measuring the amount of work that could be performed by the patients under standardized conditions without inducing anginal pain and also by observing the clinical response and the exercise electrocardiogram.

Glyceryl trinitrate, erythrol tetranitrate, mannitol hexanitrate, and triethanolamine trinitrate biphosphate were all much more effective sublingually than when swallowed. Glyceryl trinitrate and erythrol tetranitrate when administered sublingually are among the most effective of all prophylactic agents available for the treatment of patients with angina pectoris. The comparatively prolonged duration of action of erythrol tetranitrate, when given sublingually in doses of 30 mg. 3 times daily for at least 1 week, makes it especially valuable for clinical use. Glyceryl trinitrate and erythrol tetranitrate were also effective when administered parenterally or by inunction, but their value was markedly limited when swallowed. This suggests that these nitrites are inactivated in the gastrointestinal tract.

Mannitol hexanitrate also was more effective sublingually than when swallowed but was of limited clinical value because of the large size of the tablets available. Triethanolamine trinitrate was moderately effective when administered sublingually but was of no demonstrable value when swallowed. Sublingual therapy with this drug is limited because of the frequent glossitis that follows its use. Pentaerythritol tetranitrate showed little difference in the frequency of response when administered sublingually or when swallowed, but the increase in exercise tolerance was somewhat greater after sublingual administration. This drug was only of moderate value in the treatment of patients with angina pectoris. Sodium nitrite was more effective when given subcutaneously than when given sublingually or when swallowed, but the degree of value was low and the frequency of untoward reactions was too high to indicate clinical value.

Treatment of Ascariasis with Various Salts of Piperazine. L. G. Goodwin and O. D. Standen. Brit. M. J. 1:131-133 (Jan. 18) 1958 [London].

The authors report on 770 patients, most of them schoolchildren, with ascariasis, who were treated with piperazine preparations given as a single large oral dose in 2 successive trials carried out in Gambia, Africa. In the course of the first trial in 1955, 386 patients were given a 3-Gm. dose and an additional 56 were given a 4-Gm. dose equivalent of piperazine hexahydrate. The piperazine salts employed were the citrate, adipate, phosphate, sebacate, and stearate. Except for the bulky insoluble stearate which was mixed with water and given as a draft, all the salts were given in tablet form. A dose equivalent to 3 Gm. of piperazine hexahydrate gave clearance in 293 (76%) of the 386 patients, and a dose equivalent to 4 Gm. of piperazine hexahydrate gave clearance in 25 (89%) of the 28 patients treated with piperazine phosphate and in 23 (82%) of the 28 patients treated with piperazine adipate. Piperazine sebacate and piperazine stearate gave clearance in 98 (86%) of the 114 patients treated with either one of these 2 salts in a 3-Gm. dose equivalent of piperazine hexahydrate, but they were impracticable in use on grounds of taste or bulk. It was established that the efficiency of piperazine preparations is directly related to the content of the base and is little influenced by the nature of the salt.

In the course of the second trial in 1956, 328 patients with ascariasis were treated with piperazine citrate syrup or solid piperazine citrate in tablet form. The large dose of 4 Gm. of piperazine was given to all patients in order to obtain a maximal clearance rate from a single treatment. Seventy-six (84%) of the 91 patients who received the solid preparation were cleared, and 38 (86%) of 44, 87 (88%) of 99, and 82 (87%) of 94 patients were cleared, respectively, with piperazine citrate syrup when the syrup was used after storage for 6 months at 50 C (122 F), at 37 C (98.6 F), or fresh. Piperazine citrate syrup thus was found to be stable at elevated temperatures, to be as effective as solid citrate, adipate, or phosphate, and to be of more practical value than tablet preparations in mass treatment on grounds of rapidity of dosage, rigidity of control, and palatability. No toxic side-effects were observed after a single dose of 4 Gm. of piperazine.

Piperazine and Male Fern in Expulsion of Tape-[illegible]. L. G. Goodwin and O. D. Standen. Brit. M. J. 1:133-134 (Jan. 18) 1958 [London].

A group of native patients in the Shirati area of Tanganyika, Africa, harboring Taenia saginata (the common tapeworm of man), were treated with piperazine and extract of male fern. They were given a dose of piperazine citrate (equivalent to 3 Gm. of piperazine hexahydrate), and the next morning on an empty stomach they received 5.3 cc. of extract of male fern shaken with milk, followed 2 hours later by 2 oz. (60 Gm.) of magnesium sulfate dissolved in water. A second group of patients who served as controls were treated with extract of male fern and purge alone. Tapeworm heads were found in the stools of a larger number of patients treated with piperazine and extract of male fern than in those of patients treated with male fern alone, but the difference was not statistically significant. Piperazine used alone caused some large segments of worm to be expelled, but it did not cause the scolex to relinquish its hold of the mucosa. More than 1 tapeworm was often found in the same host. Two patients had 5 worms each, but the average for the entire group was 2. A systematic method of examining stools was used, in which the bulk of the tapeworm was picked out from the contents of the bedpan and transferred with forceps to a blackened dish, which proved invaluable because it removed the obvious difficulty of observing the smaller fragments of worm against the white background of the bedpan. Before it is possible to decide whether pretreatment with piperazine is an advantage, further work is required in which the time interval between the administration of piperazine and male fern is reduced.

RADIOLOGY

Clinical and Radiologic Evaluation of Aortic Diameters. L. Dughera and L. Mussa. Minerva med. 48:3697-3702 (Nov. 7) 1957 (In Italian) [Turin, Italy].

The authors made a clinicoradiologic investigation of the usefulness of Real's index as a routine procedure in the evaluation of the degree of dilatation and of elongation of the aortic arch in patients with defects of the aortic arch. Real's index, which utilizes the telecardiogram of the frontal position, is the ratio of the width of the thorax to the sum of the 2 transverse radiuses of the aorta. This ratio is in inverse proportion to the pathological changes in the aortic caliber and in the elongation of the vessel. Grade 1 marks a slightly defective, grade 2 a medium defective, and grade 3 a severely defective dilatation of the aorta. The present study includes 100 patients hospitalized for various diseases, most of whom were between 35 and 75 years of age, whose routine telecardiograms revealed a possible defect in the aortic arch. Real's index graded the alteration of the aortic caliber as severe in 8 patients, medium in 28, slight in 36, and no change in 28. Clinical examination of the patients confirmed this grading, except for 6 patients of the last group who were found to have a cardiac lesion.

The authors conclude that Real's index is a more reliable method than the one of Vaquez and Bordet for general investigation of the correlation between alteration of the aortic diameter and clinical findings of cardiovascular disease. Real's index cannot be a substitute for the more complicated and specific methods of Kreuzfuchs, Abreu, Cabrera-Hernandez, and Faccini, but it is more practical than these for a general evaluation of the aortic diameter in mass roentgenologic examinations.

Hypertension Following X-Irradiation of the Kidneys. C. Wilson, J. M. Ledingham and M. Cohen. Lancet 1:9-16 (Jan. 4) 1958 [London].

The authors describe 2 patients in whom hypertensive renal disease developed after irradiation. A patient had a normal blood pressure when, at the age of 35 years, she received irradiation to the upper abdomen over a wide field, including the kidneys. The time when hypertension developed is unknown, because she was not observed until symptoms of uremia appeared 8 years later. The interstitial fibrosis, the atrophy of the glomeruli with fibrosis of their capsules, and the changes in the larger arteries indicated a slowly progressive nephrosclerosis. Fibrinoid arterial and arteriolar necroses and glomerular necroses were evidence of terminal acute hypertensive renal damage. In many ways these structural changes resembled malignant nephrosclerosis superimposed on benign nephrosclerosis; nevertheless, in certain respects the picture differed from any other form of Bright's disease. The features characteristic of irradiation nephrosclerosis were the diffuse interstitial fibrosis and the large numbers of fibrohyaline glomeruli, both aggregated in subcapsular fibrotic zones and scattered diffusely through the cortex. Another patient had a normal blood pressure when, at the age of 28 years, he received irradiation to the renal areas. He died of malignant hypertension less than a year later. Histologically, acute arterial and glomerular necroses were the most prominent lesions, a picture closely resembling malignant essential hypertension in its early stages. The interstitial edema could be explained by terminal heart-failure. There was no irradiation sclerosis. The contrasting histological patterns in these 2 patients have indicated the dual nature of irradiation damage to the kidneys in man.

The authors report a series of experimental studies in rats designed to clarify the relation between hypertension and structural changes in the kidney after irradiation. Three types of experiments were carried out on the rats: 1. Both kidneys were exteriorized and irradiated. 2. One kidney was exteriorized and irradiated. 3. Both kidneys were irradiated in situ. These experiments showed that irradiation of the kidneys may produce 2 biological effects: interstitial fibrosis and hypertension, which appear to be independent of one another. Irradiation sclerosis of the kidney is a composite picture of structural damage due to these separate processes. Renal hypertension may develop in the absence of any recognizable structural lesion.

Giant-Cell Tumor of Bone. V. R. Gee and D. G. Pugh. Radiology 70:33-45 (Jan.) 1958 [Syracuse, N. Y.].

The authors cite the definition of a giant-cell tumor given by Jaffe, Lichtenstein, and Portis. They show the effect of the changing concepts on the experience of the Mayo Clinic, pointing out that some of the lesions originally diagnosed as giant-cell tumor have now been reclassified pathologically as aneurysmal bone cyst, benign chondroblastoma, fibroma, benign giant-cell reparative granuloma, unicameral bone cyst, osteogenic sarcoma, fibrosarcoma, and fibrous dysplasia. A recent report on the clinical and pathological features of the Mayo Clinic's experience was based on 101 cases, the patients being seen from 1905 through December, 1953. Since that report 1 of the lesions included in the series has been reclassified as an aneurysmal bone cyst, and 4 new cases have been added. Thus, a total of 104 lesions meeting current criteria for the pathological diagnosis of giant-cell tumor of bone forms the basis for this study. Emphasis is placed on the roentgenologic aspects. The so-called typical roentgen-ray picture of giant-cell tumor may be summarized as follows: an expanding area of rarefaction situated eccentrically in the end of a long bone of a young adult. Exceptions to this description, however, were common. Expansion was absent or was only questionably present in 23%. The tumor was centrally located within the involved bone in 22%. Nearly 35% of the patients could not be classed as young adults. The most constant element in the above description was the location in the end of the involved bone. A trabeculated appearance was a prominent feature in slightly less than half of the cases. Giant-cell tumors involving flat bones lacked distinguishing radiologic characteristics. Lesions in the pelvic bones were easily obscured and might be difficult to detect. There was a lack of correlation of the initial roentgen-ray picture with the course of the disease after treatment and with the variation in microscopic features.

PUBLIC HEALTH

The Tuberculin Test as a New Approach to the New Era of Tuberculosis Control. K. H. K. Hsu. Dis. Chest 33:23-37 (Jan.) 1958 [Chicago].

The author reports her experiences with tuberculin testing at the Children's Tuberculosis Hospital and Clinic in Houston, Texas, as a new approach to the control of tuberculosis. Because so few children are tuberculin positive today, a positive reactor stands out as a warning signal, indicating that it is one of the nests from which tuberculosis is being spread and thus pinpointing the spot to which intensive search for tuberculosis should be directed. The advent of isoniazid has made possible the prevention of tuberculous sickness by early drug therapy of primary tuberculosis. This calls for intensive tuberculin testing programs to seek out infected children in order to afford them the protection of modern drug therapy. Family-contact investigation is the most effective method of finding tuberculosis today. It must be carried out with every new case of tuberculosis found, whether it would be in a tuberculous adult or in a tuberculin-positive child. For a thorough and systematic contact investigation, the organized effort of health agencies and the education of the public are essential.

to accept the clinical improvement reported by one author in patients with peripheral vascular diseases if the medicament's action is that of a microcirculatory constrictor. Contrary to the good reports available on its use in dermatology, clinical vasoconstriction of visible blood vessels characteristic of rosacea and allied conditions has not been demonstrated, although Marshall (*Wisconsin M. J.* 49:369, 1950) reported measurable skin heat changes with a thermopile after injections of Kutapressin.

WOUND DISRUPTION

To the Editor:—*On the second postoperative day, because of severe allergic reaction, 40 units of ACTH was administered to a patient, and in another instance 5 mg. of prednisolone was given four times daily for two days. Is such treatment likely to result in wound disruption?*

M.D., New York.

Answer.—Although ACTH and glucocorticoids do tend to inhibit wound healing when given in large doses to experimental animals, the amounts stated in the question are unlikely to produce wound disruption in man.

ESTROGENS FOR MEN

To the Editor:—*Is there any estrogen that can be safely given to men without the risk of producing gynecomastia? Estrogenic substances combined with testosterone have been tried, but they too gave rise to pain in the breast.*

M.D., New Jersey.

Answer.—No known estrogen can be given to men without eventually producing gynecomastia.

STRESS INCONTINENCE IN A MAN

To the Editor:—*A total transurethral resection was performed on a 78-year-old man in January, 1957, for a prostatic condition. He had carcinoma, grade I-2. Since then he has taken 2.5 mg. of conjugated estrogens twice daily. His bladder capacity is normal, he has no stricture, and his prostate appears to be smooth and normal by rectal digital and cystoscopic examination; however, he has intractable stress incontinence when on his feet. What results can be expected from operative attachment of the bladder to the abdominal wall? Would results from any other treatment be better?* *M.D., West Virginia.*

Answer.—Transurethral prostatic resection, whether performed for benign prostatic hyperplasia or for carcinoma, occasionally may result in urinary incontinence of varying degrees. This leakage often results from weakening of the external sphincter of striated muscle, which extends into the apex of the prostatic capsule for about 7 mm., according to Beneventi and Marshall (*J. Urol.* 75:273, 1956). Surgical correction of this type of incontinence has not been rewarding. Attaching the bladder to the symphysis pubis or abdominal wall is more successful in women. Hayes has reported an excellent result in a patient with the type of disease described in whom the levator ani muscles were brought together in the midline through a perineal incision and sutured to the bulb of the urethra (*South. M. J.* 48:234, 1955). Foley made a cutaneous tunnel around the deep urethra through which he placed a circular pneumatic bulb controlled by a tube leading to the patient's trousers' pocket (*J. Urol.* 58:250, 1947). The patient passed his urine by pocket control. Most patients wear a rubber urinal or use a Cunningham incontinence clamp. An inlying Foley catheter bag draining into a disposable leg bag of plastic might tide the patient over some temporarily difficult situation, such as a motor trip.

DROWSINESS WITH OXYGEN THERAPY

To the Editor:—*A patient with lung disease, when oxygen is administered, becomes drowsy and his respiration decreases. Does positive pressure breathing decrease the blood carbon dioxide concentration? If so, by what mechanism does this occur? It is advised to give oxygen to such patients at a flow rate of 2 or 3 liters per minute. Acetazolamide can reduce the blood carbon dioxide concentration in emphysema, but this would require days. If the patient needs oxygen and has pneumonia in addition to emphysema, is positive pressure breathing still indicated?*

M.D., West Virginia.

Answer.—It is assumed that the patient has emphysema with carbon dioxide narcosis. Continuous positive pressure breathing with oxygen in such a patient may cause hypoventilation and would be harmful. Intermittent positive pressure breathing, however, with the addition of a bronchodilator, such as isoproterenol hydrochloride, may decrease the arterial pCO_2 by increasing the alveolar ventilation. The rate of oxygen administration should be started at 1 liter per minute and gradually increased. A simple nasal catheter may be sufficient. Acetazolamide should be tried for maintenance therapy rather than for the treatment of the acute narcosis. The patient with pneumonia and emphysema who needs oxygen should be given either the intermittent positive pressure type of administration or oxygen at the reduced flow rate. A Drinker respirator would be the most effective type. When difficulties arise with the administration of oxygen, the respirator may be a lifesaver. When large amounts of secretions are present in the tracheobronchial tree, vigorous methods of aspiration, such as the use of a tracheal catheter, are in order. At times, even a tracheotomy may be necessary.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

A. M. A. Urges Hill-Burton Extension . .
Bill for U.S. Aid to Public Health Schools . .
Completion of Library of Medicine is Forecast . .
A. M. A. Urges Retaining Freedom of Choice in Medicare . .

A. M. A. FAVORS HILL-BURTON CONTINUATION, LOAN GUARANTEES

The American Medical Association thinks that the Hill-Burton hospital construction program has been handled in an "extremely effective manner" and wants the operation continued beyond its scheduled expiration date of June 30, 1959. The Association also would like to see Congress authorize mortgage guarantees by the federal government for construction of hospitals and nursing homes, proprietary as well as nonprofit.

The A. M. A.'s views were presented to the health subcommittee of the House Interstate and Foreign Commerce Committee by Drs. Julian Price, a trustee, and Willard Wright, chairman of the A. M. A. Committee on Medical and Related Facilities.

Dr. Price explained that the A. M. A.'s reaffirmation of support for the Hill-Burton program, as well as the changes it was recommending in the program, were based on a 14-state survey conducted by Association staff people. Six of the 14 states were rural, and investigators interviewed more than 200 persons over the country who are closely involved in hospital operations.

"It is our conclusion," Dr. Wright said, "that with few exceptions the Hill-Burton construction program has been administered efficiently and in the interests of the public and that the objectives of the original legislation are, to a large degree, being achieved."

Questioned by Chairman John Bell Williams (D., Miss.) on the length of time for the extension, Dr. Wright said: "As long as it seems to be needed." Mr. Williams has indicated that he favors a two-year extension, so each Congress can reappraise the operation, rather than the five years suggested in some bills before the subcommittee.

The following changes were proposed by Dr. Wright:

1. Elimination of both diagnostic-treatment and public health centers from benefits under the Hill-Burton program. "There is little evidence of a need or demand for such provisions to build the ill-defined units (diagnostic-treatment centers)." The A. M. A. wants the public health centers dropped because its survey showed that the particular 14 states covered contained 89.4% of the total number of projects of this type and that 76.4% of all U. S. money earmarked for the centers. In addition to criticizing uneven distribution of this money, Dr. Wright said that the A. M. A. believed facilities of this nature—for the use of public employees—should be provided by the states or communities, not by the federal government.
2. The mandatory priority given rural communities should be eliminated, inasmuch as the survey by A. M. A. showed that great progress already has been made in meeting hospital needs of farm areas and smaller towns.
3. Emphasis should be shifted toward facilities for the chronically ill and nursing homes and for the modernization, renovation, and remodeling of old hospitals. To this end, states should have greater latitude in establishing priorities and allocating funds.
4. To make it easier for states to make the best use of total money, all present categorical grants should be eliminated and one single appropriation made for all types of facilities.

After saying that the A. M. A. has taken no action on bills before the committee for setting up a loan program under the Hill-Burton act, Dr. Wright announced: "It is the position of the American Medical Association that a government-insured loan program of the FHA type for hospitals and nursing homes, both nonprofit and proprietary, should be approved."

Dr. Robin C. Buerki, chairman of the council on government relations of the American Hospital Association, testified that the AHA favored a five-year extension of the program; 75 million dollars annually exclusively for renovation and modernization; direct government long-term, low-interest or noninterest loans, but not loan guarantees; and annual appropriation of several hundred million dollars.

Asked by Mr. Williams about the differences in A. M. A. and AHA views on direct U. S. loans or loan guarantees, Dr. Wright said that the A. M. A. favored loan guarantees but that this was not a completely "fixed position."

PUBLIC HEALTH SCHOOLS BILL PASSES HOUSE

The house, after brief debate, has passed and sent to the Senate a bill for a two-year program of 1 million dollars a year to be divided among 11 schools of public health. The money would be used for providing comprehensive professional training, specialized consultative services, and technical assistance in the field of public health, but not for operating expenses.

The final version [illegible] the House also stipulated that, in [illegible]s, the surgeon general of the Public Health Service shall give primary consideration to the number of federally sponsored students attending each public health school.

Chairman John Bell Williams, of the House Interstate health subcommittee, which had conducted hearings on the bill, explained that a two-year limi-

(Continued on next page)

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Lown, B., and Levine, S. A.:
Current Concepts in Digitalis Therapy, Boston,
Little, Brown & Company, 1954, p. 23, par. 2.

tation had been placed on the measure in order to allow Congress time to reconsider recommendations anticipated from a PHS conference to be held later this year. The conference will look into the effectiveness of the public health traineeships program established two years ago. Proponents of the pending bill originally wanted the 1-million-dollar program to run for three years.

The measure also was amended from its original version to limit the use of grants to specific programs rather than for general operating expenses. Representative Neal (R., W. Va.) explained it to the House this way: "One of the reasons why I think we are justified in approving this particular legislation is that the federal government is providing more than half of the students that attend these public health schools and in so doing is providing *nothing further than tuition*. And that, of course, falls far short of the cost of educating these much-needed public health servants, doctors, nurses, sanitarians, and others. So we feel that the change of wording in this law will give the Public Health Service surgeon general sufficient power, in his discretion, to allocate these funds to the various schools in regard to their qualifications for doing specific and special types of training in regard to the number of students they are going to provide for."

COMPLETION OF LIBRARY OF MEDICINE BUILDING IS FORECAST

The new building to house the National Library of Medicine will be completed in 1962, according to present planning. This was the report of the library's director, Lt. Col. Frank B. Rogers, to a Senate appropriations subcommittee that criticized the delay in start of construction on the building, authorized by Congress two years ago.

Col. Rogers said that it would take another nine months before plans for the structure are ready and then more than three years to complete building the structure and installing equipment. He explained that a difference of opinion over the exact location on the National Institutes of Health Grounds was partly responsible for the delay.

Money for construction was not included in the President's budget submitted to Congress, and it was not added in the House, which increased a number of other health appropriations. Indications were that the Senate subcommittee might include enough money for a start on the building.

Col. Rogers testified that the new library will provide sufficient stack area for a collection twice the size of the library's present holdings, the largest collection of medical literature in the world. The library has more than a million items (periodicals and other material as well as books). "In the last two years," Col. Rogers said, "the library has increased its procurement of Russian medical literature and shortly will publish a Russian-English medical dictionary, the only one in existence, to help researchers make use of the Russian writings."

A. M. A. URGES FREEDOM OF CHOICE BE RETAINED IN MEDICARE

The American Medical Association is joining other professional groups in urging Congress not to eliminate freedom of choice under Medicare, as proposed by some members of Congress.

The issue arose in a subcommittee of the House Appropriations Committee, which is considering appropriations for the military dependent medical care program. Earlier military witnesses at closed hearings had suggested that money is being wasted by allowing dependents to be cared for by civilian physicians and in civilian hospitals when beds are empty in some military establishments.

In a letter to Rep. George H. Mahon, chairman of the subcommittee, A. M. A. General Manager F. J. L. Blasingame said that the Association "does not agree that tax money would necessarily be saved" if dependents are denied free choice. Furthermore, he declared, "we are convinced that elimination of free choice would result in lessening the amount of authorized medical care now available to and received by the dependents."

Dr. Blasingame pointed out that it is difficult to make an accurate cost comparison between civilian and military medical expenses, largely because depreciation, fringe benefits for military medical personnel, and expenses of recruitment and training are not included in computing military medical costs.

He also emphasized that making military care mandatory would "most certainly compound administrative problems" and that much of the cost to date in Medicare is misleading as it is "non-recurring."

The letter concludes:

"We believe it is of first importance that no change in the program be permitted to deprive those dependents of medical care who are not within reach of military facilities, or permitted to recreate even in part the grossly discriminatory situation which existed prior to this program. There is no assurance that if this program is to be limited, the persons now receiving care will not in fact be denied access to medical care."

A letter from Kenneth Williamson, director of the *American Hospital Association's Washington office*, also challenged the claim that military medical care is less expensive than civilian. He added:

"To eliminate the free choice provision in the law, as spelled out in the 'implementing directives,' would necessitate in many instances the exclusive utilization of military and naval facilities staffed by physicians in the uniformed services. Should this occur, and should the armed services take over the civilian phase of Medicare, or a substantial part of it, an increased demand for physicians in uniform would also undoubtedly result—a demand which could probably be met only by reactivation of discriminatory draft legislation.

"In any thorough consideration of the program, it should be emphasized that dependents of those in the uniformed services are civilians and should seek their medical treatment through civilian channels if we are to preserve the beneficial aspects of our present system of providing medical care and to guard against further maldistribution of professional health personnel.

"The Medicare program has been accepted by dependents of service personnel and by the medical profession, and it is our understanding that it has been successful. We have also been advised that it has been economically and wisely administered. It is, therefore, our sincere recommendation that no major change affecting choice between civilian and military *facilities be made in the Medicare program* at this time."

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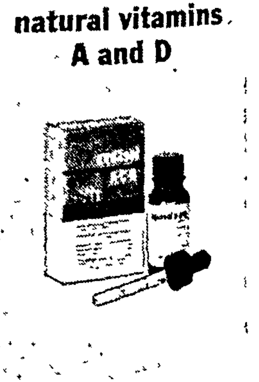

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THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 167, NO. 3

CHICAGO, ILLINOIS

MAY 17, 1958

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COARCTATION OF THE AORTA AND PREGNANCY

REPORT OF TEN CASES WITH TWENTY-FOUR PREGNANCIES

W. Raymond Shanahan, M.D., Seymour L. Romney, M.D.
and
James H. Currens, M.D., Boston

Pregnancy is not rare in patients with coarctation of the aorta and the possibility of the existence of this abnormality should be considered in every case of hypertension occurring during pregnancy or soon thereafter. The absence of toxemia of pregnancy and fetal mortality in patients with coarctation of the aorta is impressive, and only one report was found that mentioned such an occurrence. This is in sharp contrast to the incidence of toxemia of pregnancy in patients with hypertension from other causes, which varies in reports in the literature from 10 to 30%. Coarctation of the aorta associated with pregnancy is an important abnormality which requires operation in many cases. Although there is not sufficient evidence to draw definite conclusions about the optimal time for resection, if resection of the coarctation is planned, it should probably be deferred until after delivery. The apparent lack of cardiovascular complications during labor argues against cesarean section and in favor of a pelvic delivery for patients with coarctation of the aorta.

IT HAS BEEN our clinical impression at the Boston Lying-In Hospital that patients with coarctation of the aorta have tolerated pregnancy well. Recently, a patient was observed in whom the blood pressure was normal during pregnancy but rose considerably during the postpartum period. This case renewed interest in the subject of coarctation of the aorta and pregnancy, and it is the purpose of this report to review the experience in this connection at the Boston Lying-In Hospital during the past 25 years.

Method of Study

A survey of the records at the Boston Lying-In Hospital revealed eight cases (including two already reported[1]), and two additional patients were seen privately. A study of these records was then undertaken to determine the variation in blood pressure throughout pregnancy and during the postpartum period. The recordings which were charted and evaluated were all taken under similar circumstances in the outpatient department by familiar personnel, either a doctor or a nurse and frequently both. Blood pressure readings obtained in other hospitals or by other doctors were excluded from the study so as to obtain the maximum uniformity possible. Special search was made for

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From the Boston Lying-In Hospital, the Massachusetts General Hospital, and the Department of Obstetrics, Harvard Medical School. Dr. Romney is now at the Albert Einstein College of Medicine, New York.

evidence of proteinuria in the laboratory charts, and each record was studied for evidence of toxemia of pregnancy.

Results

The 10 patients had a total of 24 pregnancies. Three of these patients subsequently had surgical repair of coarctation at the ages of 23, 20, and 40 years, and one of them had two further pregnancies postoperatively, the details of which are not included in the subsequent data.

Table 1.—*Data on Blood Pressure in Twenty-four Pregnancies in Ten Patients with Coarctation of Aorta**

Case No.	Age at Pregnancy, Yr.	Blood Pressure, Mm. Hg: Change During Pregnancy	Blood Pressure, Mm. Hg: Change 6-8 Wk. Post Partum
1	19	Increase‡	0
	23		
2	18	160/90 to 120/85	
	21		0
3	22	0	
	26	140/95 to 120/70	Increase to 170/110
4	23	Decrease§	
	29	0	0
5	28		
	30	0	
	36		
6	20	0	Increase to 190/125
	22	180/100 to 120/80	0
7	17	0	0
	21	0	
	24	0	Increase to 180/110
8	21		
	23		
	25		
9†	21	0	0
	30	0	
10	24		
	26		0
	30	0	Increase‖

* All infants alive.
† Abdominal coarctation proximal to renal arteries.
‡ Figure 1.
§ Figure 2.
‖ Figure 3.

Fifteen of the 24 pregnancies were observed at the Boston Lying-In Hospital, and in these a sufficient number of blood pressure recordings (7 to 18, with an average of 14 per pregnancy) were made to determine the change, if any, of the blood pressure during the pregnancy. In 10 of the 15 no significant change occurred in the blood pressure during the course of gestation. Four patients had an appreciable lowering of the blood pressure during the second or third trimester of pregnancy. In one instance the blood pressure rose late in pregnancy to unusually high levels, and this pregnancy was terminated by cesarean section. In 7 of the 15 pregnancies a blood pressure recording of less than 120/90 mm. Hg was made at least once in the outpatient department.

In 11 of these 15 pregnancies the blood pressure was recorded six to eight weeks post partum under similar conditions. In seven instances the level was similar to that found during pregnancy. In four patients the blood pressure was distinctly higher post partum than at any time during pregnancy. When these patients were seen subsequently over periods of months or years, the blood pressure tended to be lower than the level found six to eight weeks post partum.

The 24 pregnancies were singularly free of obstetric complications. There were no materna fatalities and no stillbirths or spontaneous abortions. Proteinuria of more than slight degree wa not found in any instance. Seventeen pregnancie terminated by vaginal delivery (spontaneously i three), and the remaining seven had cesarean sections at term. Three of these sections wer performed on one patient because of pelvic disproportion, while coarctation of the aorta wit hypertension was the indication in the other four.

The data concerning the 24 pregnancies ar summarized in table 1. The following case historie are presented to illustrate certain of the abov points.

Report of Cases

Case 1 (Intermittent Hypertension with Rise in Blood Pressure Late in Pregnancy).—The patient developed marke elevation of her blood pressure late in pregnancy. She wa first seen at the Boston Lying-In Hospital in 1935 at the ag of 19. She was then in the 32nd week of her first pregnanc and had a blood pressure of 130/80 mm. Hg. Two week later this had risen to 170/80 mm. Hg, and she was admitte to the hospital, where the diagnosis of coarctation of th aorta was made. During her three-week period as an inpatient, her blood pressure was quite variable and ranged between 130/80 and 255/110 mm. Hg. She was followed the outpatient department for the remainder of her pregnancy and had fluctuations in blood pressure between 215/8 and 165/90 mm. Hg. A recording of 265/130 mm. Hg wa noted at term. An elective cesarean section was accordingl *performed. Three weeks later her blood pressure was* 210/14 *mm. Hg, recorded in the outpatient department* (Fig. 1).

Four years later she again became pregnant. She was attended by her family physician and was delivered at tern by cesarean section. During the following 15 years her famil physician found that her blood pressure ranged from 260/100 to 180/110 mm. Hg. In 1954, at the age of 40, she had surgical repair of her aorta, and two years later her blood pressure was reported to be 130/70 mm. Hg.

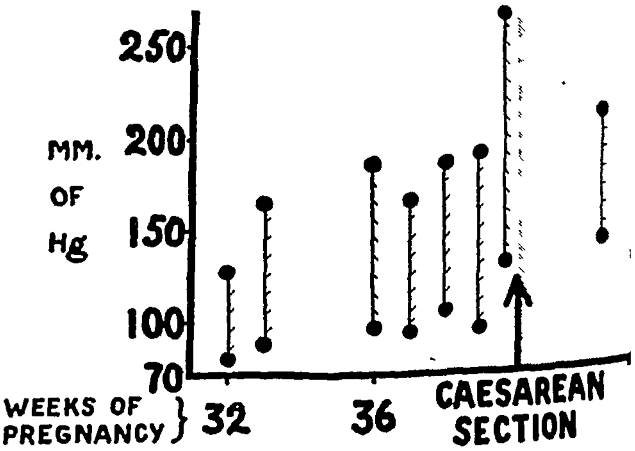

Fig. 1 (case 1).—Rise of blood pressure *as recorded* in outpatient department late in pregnancy. Blood pressure while patient was hospitalized from 33rd to 36th week of pregnancy varied greatly, 130/80-255/110 mm. Hg.

Case 4 (Decrease in Blood Pressure During Pregnancy).—The patient had a decrease in blood pressure during he first pregnancy but not during her second. She was diagnosed as having coarctation of the aorta in 1932 at the age of 1 years, when she was found to have a blood pressure of 160/-

120 mm. Hg and notching of the ribs shown by x-ray. Between 1937 and 1940, blood pressure readings varied between 190/115 and 190/140 mm. Hg. She became pregnant for the first time in 1943 at the age of 23 years and was seen at the Boston Lying-In Hospital when 17 weeks pregnant. The blood pressure was then 180/120 mm. Hg and decreased gradually to 135/90 mm. Hg at 28 weeks of gestation. Five weeks later it had risen to 150/105 mm. Hg and remained at about this level until term (fig. 2). After a normal labor she was delivered by low forceps extraction. Five months post partum her blood pressure was 180/110 mm. Hg.

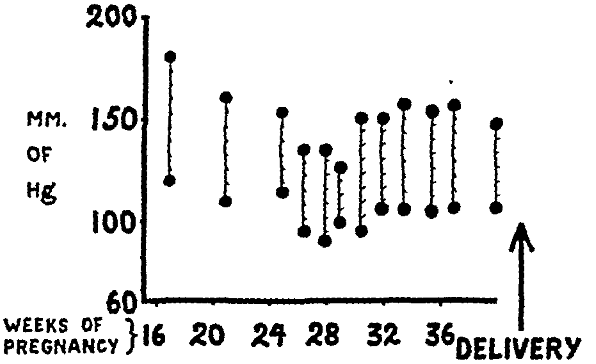

Fig. 2 (case 4).—Decrease in blood pressure during second and third trimesters of pregnancy.

From the age of 26 to 29 years her blood pressure was noted at another clinic to vary between 195/130 and 165/120 mm. Hg. At age 29 she was again seen at the Boston Lying-In Hospital, in the 17th week of her second pregnancy, with a blood pressure of 160/110 mm. Hg. The blood pressure during this pregnancy did not show the decrease observed during *her first pregnancy but remained at about the same level until* delivery, varying between 160 and 190 mm. Hg systolic and 100 and 120 mm. Hg diastolic pressure. Two months after delivery her blood pressure was 180/125 mm. Hg. Five years later blood pressure readings of 185/120 and 170/140 mm. Hg were recorded.

Case 10 (Postpartum Hypertension).—The patient had considerable elevation of her blood pressure post partum after having had three uneventful pregnancies. When this patient was seen in the 12th week of her third pregnancy her blood pressure was 110/65 mm. Hg. She had already had two uncomplicated pregnancies at other hospitals, although the second was marked by a slight systolic but not diastolic hypertension. Her blood pressure exceeded 130/90 mm. Hg only once during her third pregnancy, a reading of 140/60 mm. Hg being recorded at the 36th week. Considerable surprise resulted when her blood pressure was found to be 200/100 mm. Hg six weeks post partum (fig. 3). She was examined two months later by one of us, who noted slight aortic regurgitation as well as the signs of coarctation of the aorta The blood pressure at this examination was 180/100 mm. Hg. Her blood pressure determined under the same conditions as during pregnancy by the same observer ranged from 160 to 140 mm. Hg systolic and 110 to 90 mm. Hg diastolic. Surgical repair of her aorta was advised and was performed successfully on Feb. 5, 1956, with the use of a homologous aortic graft. The blood pressure continued to be slightly elevated soon after operation and was 145/100 mm. Hg 5 days and 160/90 mm. Hg 14 days after operation. Six weeks and one year postoperatively her blood pressure was normal at 120/70 mm. Hg. The grade 2 aortic diastolic murmur persisted.

Comment

The mechanism of hypertension associated with coarctation of the aorta is more complicated than mere mechanical obstruction at the site of the coarctation.[2] Elevated diastolic blood pressure in the legs has been observed in a few patients with coarctation, but it has not been determined whether this represents a "damped" reading from the pressure in the aorta proximal to the coarctation through the collateral circulation or an increase in peripheral vascular resistance of the whole body.[3] A delay of a few weeks for the blood pressure to return to a normal level after reconstructive surgery when such occurs is common, as in case 10 of this report. Counihan[4] has noted a failure of the blood pressure in the arm to return to normal in many patients in whom successful reconstructive surgery to the aorta had been accomplished. Although mechanical obstruction is frequently important in the hypertension associated with coarctation, these observations indicate that other mechanisms are involved which are not well understood.

The reports in the literature are not in agreement as to whether the blood pressure changes appreciably during pregnancy in normotensive patients. A rise in the diastolic blood pressure during the last few weeks of pregnancy may represent a return to a normal level. Many hypertensive patients seem to have lower blood pressure readings during early and mid-pregnancy than during the third trimester or after pregnancy.

Interest in the association of coarctation of the aorta and pregnancy received a great stimulus when corrective surgery for the abnormality was developed in 1944. Only 39 cases of this combination were reported prior to 1945, but the total had mounted to 96 by 1955, when Rosenthal[5] reviewed the world literature. Thirty-five further cases have since been reported.[6]

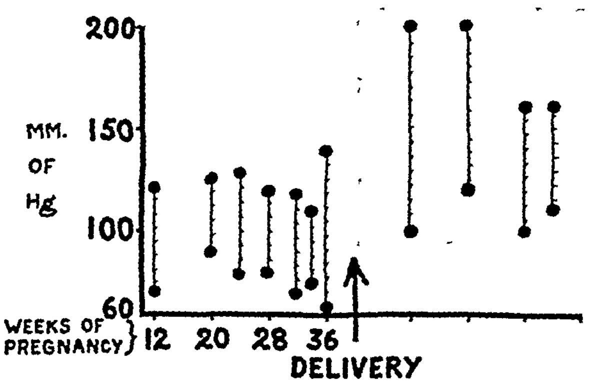

Fig. 3 (case 10).—Rise in blood pressure to hypertensive levels during postpartum period. Blood pressure was normal two months after resection of coarctation of aorta.

As pregnancy is not excessively rare in patients with coarctation of the aorta, the possibility of the existence of this abnormality should be considered in every case of hypertension occurring in pregnancy. The points of importance in clinical examination are well known: (*a*) a basal systolic murmur which is well heard over the upper midback;

(*b*) an aortic diastolic murmur in one-third of the cases; (*c*) absent or reduced pulses in the legs; (*d*) prominent systolic pulsation in the neck; (*e*) the presence of collateral vessels which, if not immediately obvious, may become visible if the patient bends forward with arms extended above the head; and (*f*) notching of the ribs shown by x-ray. The last mentioned is not diagnostic; however, as it is occasionally found in other conditions, such as neurofibromatosis.

The behavior of the blood pressure during pregnancy in patients with coarctation is of considerable interest but received little attention until studied by Dixon and Hartley.[7] These authors found that the blood pressure fell in two patients in the middle trimester and then rose toward its prepregnancy level near the end of pregnancy. This is similar to the behavior of the blood pressure in some hypertensive patients, and this fact may be responsible when the diagnosis is not considered if the blood pressure is normal during pregnancy, as in case 10 of this report. The decline of the blood pressure to normal levels occurred for varying periods in seven pregnancies of this series, and a search of the literature revealed several other examples of the same phenomenon. While a decrease from previously higher levels may be found, in some of the pregnancies in this series this decline was not seen and the pressure continued at about the same level throughout pregnancy. Few of the recorded case histories give any information about the level of the blood pressure before pregnancy, but the available data do not contain any example of the pressure being appreciably higher during than before pregnancy. The high readings immediately before delivery in case 1 of the present series is exceptional in our experience. This case also illustrates the great variability of the blood pressure during pregnancy in some patients with coarctation of the aorta, since the patient in this case, while hospitalized for three weeks, showed a blood pressure as recorded by the nursing staff varying from 130/80 to 255/110 mm. Hg.

The absence of toxemia of pregnancy and fetal mortality in our experience in patients with coarctation of the aorta is impressive, and we were able to find only one report that mentions such occurrence.[8] This is in sharp contrast to the incidence of toxemia of pregnancy in patients with hypertension from other causes, which varies in reports in the literature from 10 to 30%.[9] Fetal mortality is also high in women with hypertension from causes other than coarctation of the aorta and is about 20%. One wonders whether the protection afforded by coarctation of the aorta to the kidneys, adrenals, uterus, or placenta from pulsating hypertension may not account for the low incidence of toxemia of pregnancy and low fetal mortality.

Postpartum hypertension, usually transient, was first noted by Stout and was estimated to occur in about 15% of all pregnancies. A more recent estimate of the frequency of postpartum hypertension is between 1 and 6%.[10] Such a finding in 4 of 11 pregnancies (35%) six to eight weeks post partum would therefore seem to be an unusually high incidence of this phenomenon in patients with coarct tion of the aorta. Three of four patients in who postpartum hypertension occurred were observe during another pregnancy in which this phenome non was not noted. All four patients showed tendency toward a return to lower blood pressur levels after months or years. One of two patients o Dixon and Hartley also had a higher blood pressur reading post partum than during pregnancy.[7] I some instances, this postpartum elevation may rep resent a return of the blood pressure to its prepreg nancy level. This explanation, however, does no seem to account for the striking increase found i case 10 of this series.

The possible hazard of complications resulting from elevation of the blood pressure in the latte months of pregnancy has influenced the handling of these patients considerably. The usual treatment has been cesarean section at term so as to avoid the strain of labor with the expected increased incidence of rupture of the aorta and cerebral hem

TABLE 2.—*Reported Fatalities During Pregnancy and Post Partum in Patients with Coarctation of the Aorta*

Author	Age of Patient, Yr.	Previous Pregnancies, No.	Stage of Pregnancy at Which Death Occurred	Cause of Death	Other Lesions
Kreigh, M.: Vrtljschr. prakt. Heilk. 137:17, 1878	28	2	9th mo.	Cerebral vascular accident	...
Fawcett, J.: Guy's Hosp. Rep. 59:1, 1905	45	8	14 days post partum	Congestive failure	Patent ductus arteriosus
Katz, H.: Arch. f. Gynaek. 115:283, 1921	25	1	"Late"	Ruptured aorta	...
Strassman, G.: Beitr. z. gerichtl. Med. 5:91, 1922	25	1	"Late"	Ruptured aorta	...
Abbott, M.: Clinical Significance of Bicuspid Aortic Valve, Libman Anniversary Volume, New York, International, vol. 1, 1932	34	0	6 days post partum	Cardiac failure	Bicuspid aortic valve
Billinghurst, W. B.: Brit. M. J. 1:302, 1943	23	0	1 day post partum	Ruptured aorta	...
Kinney, T. D., and others: Am. J. M. Sc. 210:725, 1945	23	0	6½ mo.	Ruptured aorta	...
Vander Veer, J. B., and Kuo, P. T.: Am. Heart J. 39:2, 1950	26	0	8th mo.	Ruptured aorta	...
Rosenthal [5]	43	4	38th wk.	Ruptured aorta	...
Rosenthal [5]	30	0	38th wk.	Ruptured aorta	...
Rosenthal [5]	24	1	20th wk.	Subarachnoid hemorrhage	...

orrhage. It is therefore surprising that we have not been able to find any death during labor recorded in the literature. The details of the 11 deaths during pregnancy or immediately after delivery which have been reported to date are given in table 2. A study of this table shows the following facts: 1. Death from intracranial hemorrhage is uncommon. 2. Death from congestive failure has occurred only in patients with cardiac lesions in addition to coarctation. 3. The greatest hazard in these patients is that of rupture of the aorta. Rupture of the aorta is more likely to occur during the last month of pregnancy than during labor, and in only one of the seven deaths from rupture of the aorta reported in the literature the patient might have had a better prognosis if cesarean section at term had been planned. This possible failure of conservative therapy is balanced by a case of fatal peritonitis secondary to a cesarean section performed because of the presence of coarctation.

The recorded mortality of 10% must be viewed in its proper perspective and not ascribed solely to the effect of pregnancy. In 1947, Reifenstein, Levine, and Gross published a survey of coarctation of the aorta. They found that 60% of the patients died before the age of 40 and that 75% of the fatalities were directly related to the condition. Twenty-two per cent of the deaths were due to subacute bacterial endocarditis, and the average age at death was 28 years. Twenty-three per cent died as a result of rupture of the aorta at an average age of 27 years, and 29% died of hypertensive causes at an average age of 32 years. Consequently, any series of pregnancies would be expected to contain an appreciable number of fatalities on the basis of coincidence alone. However, the finding that the last weeks of pregnancy are a time of increased hazard is supported by other evidence. Schnitker and Bayer[11] found 49 cases of spontaneous dissecting aneurysm of the aorta in young patients reported in the literature, and 24 of these occurred during pregnancy. Of these cases, only five occurred during the first six months of pregnancy, whereas four occurred at seven months, five at eight months, and five at term but only two during labor. A number of cases of spontaneous rupture of the renal and splenic arteries during pregnancy have also been reported, and the majority of these have occurred during the last two months of pregnancy.[12]

There is no doubt that coarctation of the aorta is an important abnormality which requires operation in many cases. Although several patients have had surgery for this condition during pregnancy,[8] there is not sufficient evidence to draw definite conclusions about the optimal time for resection. In view of the relatively low incidence of rupture of the aorta during pregnancy, surgery before delivery may be a greater danger than conservative therapy. Thus, if resection of the coarctation is planned, it should probably be deferred until after delivery.

The incidence of rupture of the aorta during the last month of pregnancy is low when allowance is made for the fact that many patients with coarctation of the aorta and uneventful pregnancies undoubtedly escape recording. These patients, therefore, should be allowed to go into labor and have a low forceps delivery unless there are other indications for cesarean section. If the blood pressure should rise abruptly late in pregnancy, the hypertension can be controlled by rest and one of the several antihypertensive drugs, such as protoveratrine.[13]

Summary

Among 10 patients with coarctation of the aorta with a total of 24 successful pregnancies, one-third had postpartum blood pressure readings higher than all of the levels recorded during pregnancy. In one case this rise was striking. Toxemia of pregnancy, however, is rare in these patients, as is fetal mortality. Death during or immediately after labor is so rare that the presence of coarctation is not an indication for cesarean section.

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IMPROVED TECHNIQUE OF COLOSCOPY

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The method of coloscopy here described is carried out during laparotomy after due preparation of the patient for colonic surgery. Through a left paramesial incision the sigmoid colon is first identified and incised, and a sterilized sigmoidoscope is inserted in the aborad direction for inspection of the lumen distal to the colotomy. Appropriate placement of a purse-string and of rubber-shod intestinal clamps permits inflation of the intestinal segment with air; this renders polyps, diverticula, and other lesions distinctly visible. The sigmoidoscope is then directed orad for inspection of the rest of the descending colon. The incision in the descending colon is then closed and another is made in the transverse colon after appropriate replacement of the intestinal clamps; this permits insertion of the sigmoidoscope first in the direction of the splenic flexure, then in the direction of the hepatic flexure. In the experience of the authors this procedure adds little to the risk of the necessary laparotomy, and it is more reliable for detecting lesions within the intestinal lumen than is palpation from the outside, digital intraluminal exploration, or transillumination.

The purpose of this paper is to present a previously undescribed technique for coloscopy that we have found to be very helpful in determining the presence and location or the absence of polyps in the colon during an abdominal laparotomy. Coincidentally, it has also demonstrated the presence, extent, and location of diverticula of the colon. It has been employed by us primarily for the latter purpose in one case and was most helpful.

It is generally acknowledged that the presence or absence of polyps in the terminal 25 cm. of the alimentary canal can be determined with certainty by direct visualization through a sigmoidoscope by an experienced proctoscopist, except in those cases in which some anatomic obstruction, rectal pain, severe hemorrhage, or the patient's objections prevent passage of the instrument up to the desired level. Above this level the presence or absence of polyps in the sigmoid and entire more proximal colon can usually be less satisfactorily determined by an x-ray study after a barium enema, often supplemented by a "double contrast" technique.

This examination by skilled roentgenologists can lead to detection of large and moderate-sized polyps with amazing accuracy. When such a lesion is demonstrated and positively diagnosed by an experienced radiologist one can be reasonably certain that a polyp is present at approximately the location shown, though its precise situation may vary if the polyp is attached to the colon by a long stalk. However, even the most confident radiologist cannot state that no other polyps are present in addition to the one demonstrated, because a barium enema x-ray study cannot be relied upon as a certain method of revealing small polyps in the colon. It is for this reason that when such a study reveals no polyps in the colon an experienced roentgenologist will not say that none exists but, more accurately, that none have been demonstrated.

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Multiple adenomatous polyps of the rectum and colon occur in a high percentage of cases.[1] Therefore, if one is discovered, every practical effort should be made to detect or exclude the presence of others so that all can be removed, because adenomatous polyps of the rectum and colon not only may produce symptoms of their own but are recognized as premalignant lesions. Hence any patient who is suspected of harboring one or more of these polyps has not received an adequate diagnostic examination until a careful sigmoidoscopic and barium x-ray study of the colon and rectum have been satisfactorily performed.

When polyps have been discovered at proctoscopic examination but none demonstrated by the barium enema, these polyps below the level of the peritoneal reflection can often be removed through the proctoscope or through a perineal incision without the necessity of opening the abdomen, and coloscopy is not employed.

However, when one or more polyps have been demonstrated by the barium enema x-ray study to be present in the sigmoid or more proximal colon, an abdominal laparotomy for their removal is indicated. During this operation we have found that coloscopy by the technique to be described is very helpful, not only in determining the presence or absence of additional unsuspected polyps but sometimes in locating the polyp that had been demonstrated radiographically but was difficult to detect by palpation at laparotomy.

The procedure has also been useful during operations for carcinoma of the colon by enabling the operator to determine accurately the presence or absence of malignancies or polyps in the colon other than the tumor for which the operation was being performed, thus permitting their removal by an extension of the operative procedure.

The importance of being certain of the presence or absence of unsuspected multiple lesions has been demonstrated by Deddish and Hertz [1b] who, by the use of coloscopy, discovered "lesions other than those detected radiographically in 46.6% of 103 cases with the preoperative diagnosis of polyps of the colon," and by coloscoping the colon remaining after a colonic resection for malignancy found unsuspected polyps or an additional malignancy in 47% of the 32 patients. Our smaller experience has been similar.

Coloscopy is also extremely helpful when exploring the colon for a possible source of bleeding in a patient with melena from some obscure cause that could not be detected by any preoperative diagnostic methods. Also, we found that coloscopy by the technique to be described proved to be helpful in determining the extent of the disease and therefore of the resection in an operation for diverticulosis and diverticulitis of the colon in the one case in which it was employed for this purpose (fig. 1).

For a number of years in the past surgeons have recognized the desirability of more adequate and reliable methods of detecting lesions within the lumen of the colon while exploring the abdomen. At first palpation through the intact wall of the colon was the method employed, but polyps are often so soft that they cannot be felt and the procedure is unreliable. Later methods consisted of inserting a finger through a colotomy incision and feeling for polyps as the colon is telescoped upon the finger. This has proved to be only slightly more reliable. Some have attempted to discover polyps by transilluminating the wall of the colon with a light passed through a colotomy incision into the lumen of the colon. The shadows made by particles of fecal material have been indistinguishable from polyps and minimized the usefulness of the procedure. The most reliable method has been to insert a sterilized sigmoidoscope through small colotomy incisions or through the open ends of the remaining colon after a colon resection and to directly visualize the interior of the colon. In our hands this has not been com-

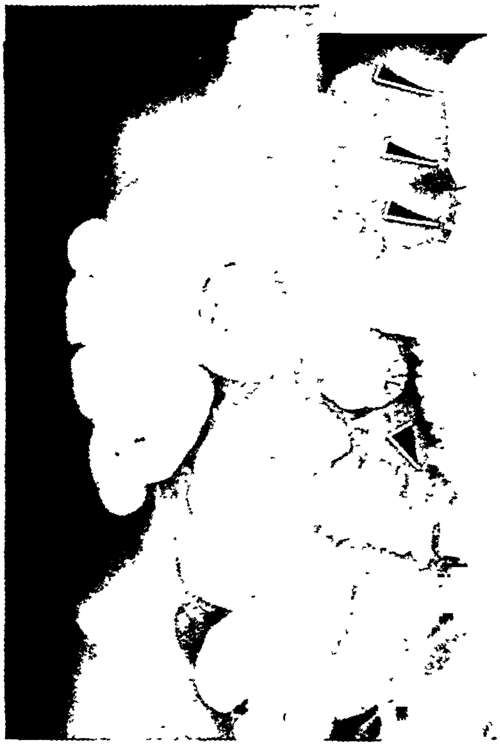


Fig. 1.—Barium enema x-ray study of colon revealing multiple diverticula. Because of overlay of left part of transverse colon and descending colon, segments in which diverticula were situated could not be determined preoperatively but were found to be localized to descending colon and sigmoid by coloscopy; appropriate resection was performed.

pletely satisfactory because the mucosa formed folds which could easily conceal a lesion. In addition, residual fecal material that obscured the field of vision was often present. Indeed, Gants, Raymond, and Pope[2] were so dissatisfied with its reliability that, after experimentation with monkeys, they have recently advocated making an extended colotomy incision throughout the entire length of the colon, if necessary, in patients with suspected polyps that cannot be discovered by palpation, transillumination, or coloscopy. They reported 10 patients in whom, by means of this procedure, they had succeeded in visualizing polyps after unsuccessful attempts with the other methods mentioned above. After the polyps had been excised or the segment of the colon in which they were located resected, the long colotomy incision was closed by suture, and the patients had uneventful recoveries. It is comforting to know that when necessary this extensive operation can be performed with safety and with no late ill-effects, but to us it seemed a procedure of much greater magnitude than coloscopy, so we directed our efforts toward improving the reliability of the latter. After some simple experimentation with coloscopy on the unprepared colons of large-sized dogs with no resultant death or morbidity, we applied the technique about to be described to a small group of patients in whom the colon had been prepared preoperatively for operation. The procedure has caused no morbidity or mortality and has provided an examination of the interior of the entire colon that has been as satisfactory and, we believe, as highly accurate as a sigmoidoscopic examination of the rectum and lower sigmoid. This technique of coloscopy differs from that described by others in that the segment of the colon to be inspected is isolated by compression clamps placed proximally and distally so that it can be distended with air to flatten out the mucosal folds and can be irrigated with water to remove any fecal material, thus providing a more satisfactory view of the interior of the colon lumen.

Technique

Preoperatively the patient's colon is prepared as for a colon resection. (We use 2 Gm. of phthalylsulfathiazole [Sulfathalidine] every 6 hours for four days supplemented with 1 Gm. of neomycin every hour for 4 doses followed by 1 Gm. every 6 hours until operation, beginning 24 hours preoperatively.)

The abdominal cavity is most frequently entered through a left paramesial incision and explored in the usual manner by palpation and inspection. The sigmoid colon is identified and a short longitudinal colotomy incision is made into the colon lumen through the anterior (antimesenteric) longitudinal taenia. This incision should approximate in length the diameter of the sigmoidoscope to be used. A temporary purse-string suture is placed around the colotomy incision but is not tied (fig. 2). The sterilized sigmoidoscope is inserted through the colotomy incision into the colon lumen and passed downward toward the rectum to a point just above the peritoneal reflection. The purse-string suture is tightened to close the colotomy incision snugly about the sigmoidoscope, preventing the escape of air so that the colon segment can be distended. The suture is not tied but is held by an assistant. A rubber-shod intestinal compression clamp is placed transversely across the sigmoid just below the tip of the sigmoidoscope and just above the peritoneal reflection. Another compression clamp is placed across the sigmoid just proximal to the colotomy incision (fig. 2). With the eyepiece in place at the proximal end of the sigmoidoscope to prevent the escape of air, the isolated segment of colon is distended by pumping in air with the sterilized rubber bulb attached to the sigmoidoscope. The air is trapped in this segment of colon by the compression clamps above and below, the tautly drawn purse-string suture around the colotomy opening, and the eyepiece in the sigmoidoscope. As a result the lumen of this segment of colon becomes distended with air and its walls are ballooned out to the desired extent (fig. 3). During this distention diverticula that may be present in the segment are likewise distended and pouch out like diverticula of the duodenum and jejunum when those parts of the intestine are distended with air, as has been described by Mahorner and Kisner.[3] This finding had not been previously thought of by us but later proved useful in determining the extent of diverticulosis in an operation for that condition. For the detection of polyps, however, the important effect is that when the colon is ballooned with air its mucosal lining is flattened out and its entire inner surface is accessible to view through the sigmoidoscope.

If fecal material is present and obscures the view, the eyepiece can be removed, allowing the colon to deflate while sterile water is injected down the lumen of the sigmoidoscope with a sterile Asepto syringe. The water is allowed to remain a few moments to dissolve partially the fecal material and then is removed by a sterile suction tube of the type used in proctoscopic examinations

This can be accomplished without spillage. The eyepiece is replaced, the colon reinflated with air, and the examination carried out. The sigmoidoscope is slowly withdrawn while the operator inspects the entire inner surface of that distended segment of colon. Visualization is excellent and equal to that seen at a proctoscopic or cystoscopic examination. Polyps, foreign bodies, the openings of diverticula, and intraluminal tumors or ulcerations were easily seen during our limited experience with the procedure.

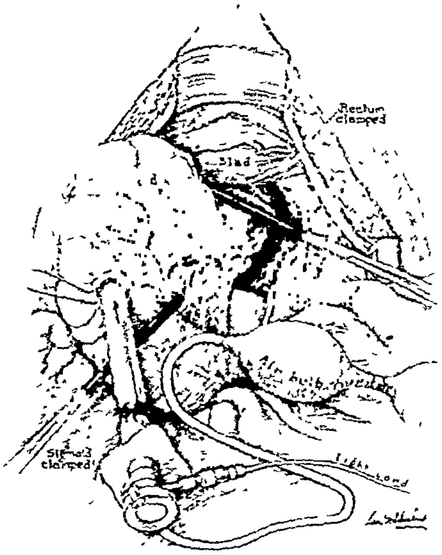


Fig. 2.—Segment of colon isolated between proximal and distal compression clamps and sterile sigmoidoscope passed through colotomy incision, which is snugged around instrument by temporary purse-string suture.

After the segment distal to the colotomy has been examined the lower compression clamp is replaced across the sigmoid at a point just distal to the colotomy and the proximal compression clamp is replaced at the splenic flexure. It may or may not be desirable to mobilize the lateral attachment of the descending colon to straighten out the colon for this part of the examination. The sigmoidoscope is reinserted through the colotomy incision and passed proximally up to the compression clamp at the splenic flexure. The purse-string suture is again tightened around the instrument, and this segment of the colon is inflated with air and the examination repeated (*central insert*, fig. 3).

After its completion the distal compression clamp is replaced across the hepatic flexure and the transverse colon is examined in a similar way. Although we have not done it, the compression clamp can be transferred from the splenic flexure to the ileocecal junction and the cecum and ascending colon examined in a similar manner. Thus the lumen of the entire colon from the ileocecal valve to the rectosigmoid junction can be examined satisfactorily, and any lesions detected can then be dealt with in an appropriate manner.

Each colotomy incision is closed as soon as it has accomplished its purpose unless that segment of the bowel is to be resected (*right insert*, fig. 3). The colotomy incisions can be closed either transversely or longitudinally (we use an inner row of 0000 chromic continuous inverting Connell's suture reinforced by an outer row of interrupted seromuscular Lembert's sutures of 00 silk). No drains are inserted unless some additional operative procedure requires them.

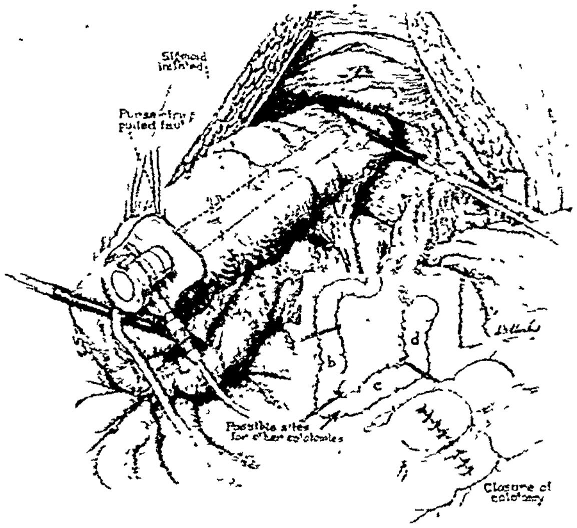
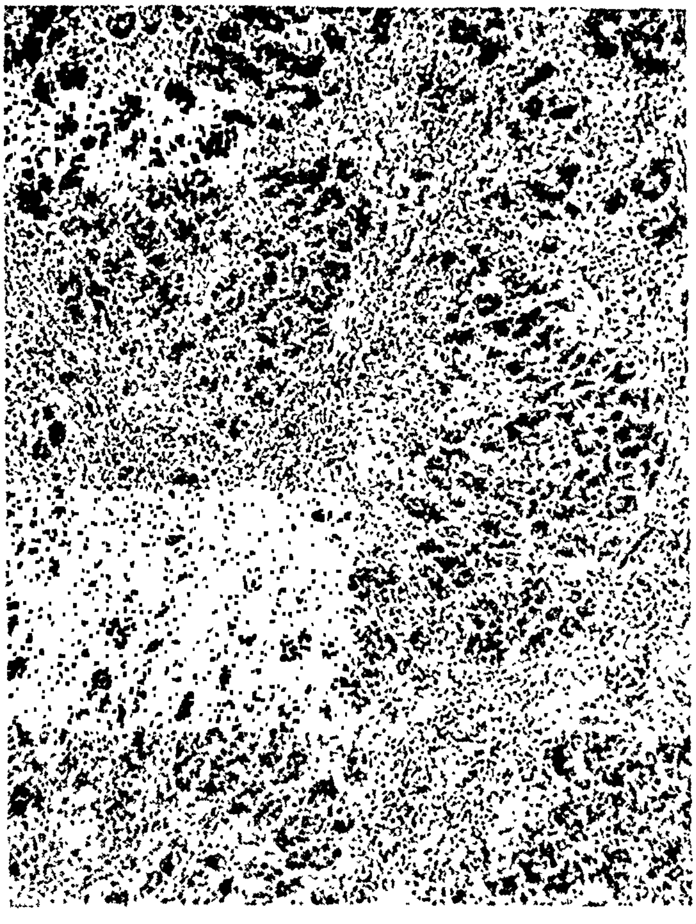


Fig. 3.—Segment of colon distended with air and ready for viewing through sigmoidoscope. *Central insert*, placement of compression clamps for inspecting more proximal segments of the colon. Colotomy incisions are made between each two clamps. *Right insert*, closure of colotomy incision.

When coloscopy is performed during an operation for a known cancer of the colon in order to determine the presence or absence of additional unsuspected malignancies or polyps, the above technique is altered slightly. There are two alternatives. One is to select the levels above and below the known malignancy at which the colon is to be transected and to occlude the lumen at those points cision. There were scattered petechial hemorrhages in the peritoneum and in the mesenteric fat. The liver edge extended to a point 4 cm. above the right costal margin. There was a moderate agonal or postmortem autolysis of the fundus of the stomach. The gastric mucosa showed scattered petechial hemorrhages and was markedly softened. The large intestine also showed scattered petechial hemorrhages. The liver weighed 980 Gm. The left lobe was markedly atrophied and thinned, measuring up to 12 mm. in thickness. The capsule was smooth and thin. The whole organ was somewhat flabby, and visible through the capsule were scattered, small, bright yellow areas of necrosis, 0.3-5 cm. in diameter. The cut surface showed bright yellow, softened necrotic tissue mottled with purplish-red areas of hemorrhage. The gallbladder and extrahepatic biliary ducts were normal. The pancreas was of normal size and appearance. The spleen weighed 280 Gm. The capsule was smooth, thin, and tense. The cut surface was dark purplish-red and somewhat firm. The lymphoid follicles were not discernible. The adrenals were normal. The kidneys weighed, together, 280 Gm. Both were swollen and showed pale, slightly icteric cut surfaces. The capsules stripped readily. The cut surfaces bulged slightly. The cortices were thickened and edematous, measuring up to 9 mm. in width. Pelves, ureters and bladder, uterus, tubes, and ovaries were normal.



Microscopic view of representative section of liver of patient with fatal hepatic necrosis due to hypersensitivity reaction to aminosalicylic acid.

Microscopic Examination.—Microscopic examination showed the pancreas and adrenal to be normal. A section of the uterus, including myometrium and endometrium, showed no abnormality. The endometrium was in the proliferative phase. The kidney showed a marked cloudy swelling of the tubular epithelium in all areas but particularly of the convoluted tubules. Occasionally, a convoluted tubule showed in addition to the cloudy swelling a vacuolization of the cytoplasm. The arteries and veins were of normal appearance. A rare hyalinized glomerulus was noted, and there were a few tiny nephrosclerotic scars in the outer cortex. There were casts of bile in the collecting tubules. These were greenish-brown and quite granular. The epithelium surrounding these bile casts was found to be undergoing varying degrees of degenerative change. In addition to these changes, there was a moderate congestion. The spleen showed only moderate congestion. The architecture was otherwise normal.

Liver.—Sections from representative areas in the liver all showed a similar appearance (see figure). There was an extreme degree of necrosis. This was patchy in distribution and involved an estimated three-fifths of the parenchymatous tissue. The areas of necrosis did not appear to have a particular distribution, varying portions of the liver lobules being destroyed. In some places the necrotic areas were enormous, occupying sections a few millimeters in diameter. In these, only the bile ducts and portal vessels remained. The intervening spaces were filled with necrotic debris, including remnants of liver cells. Some of the necrotic areas were heavily infiltrated with red blood cells; others were grossly hemorrhagic. Still other areas showed little or no evidence of hemorrhage. Occasionally, between necrotic and dying liver cells, there were strands and remnants of the reticulum supporting network. The liver cells which remained relatively intact showed varying degrees of degenerative change, including hyaline necrosis, fatty vacuolization, and granular degenerative changes of the cytoplasm. About the periphery of the necrotic areas some liver cells contained globules of bile, others were simply bile-stained. Remarkably little inflammatory exudate was present in the necrotic areas. This consisted of an occasional small clump of polymorphonuclear leukocytes and some mononuclear cells.

Anatomic Diagnosis.—The anatomic diagnosis was as follows: Severe acute toxic necrosis of the liver, bile nephrosis, petechial hemorrhages of intestinal mucosa, gastromalacia, icterus, passive congestion of the spleen, and moderately advanced active pulmonary tuberculosis.

Comment.—This patient's hepatitis was undoubtedly due to PAS hypersensitivity. Her prodromal headache, fever, arthralgia, and rash, starting about three weeks after the drug therapy was begun, were characteristic of hypersensitivity. In contrast to hypersensitivity, drug toxicity is manifested by such symptoms as tinnitus from quinine or dry mouth from atropine, which are peculiar to the particular drug used and almost always appear if dosage is sufficiently high. Hypersensitivity, although induced by any one of a number of drugs, is characterized by a similar pattern of symptoms: fever, arthralgia, lymphadenopathy, eosinophilia, transient pulmonary infiltrate, rash, and, in some cases, liver pathology, and it has no relation to dosage. The term idiosyncrasy is reserved for an unusual response to a drug, such as excitement from morphine. Unexplained fever in a patient taking PAS should always suggest the onset of a potentially lethal hypersensitivity reaction. The rash which makes the diagnosis more obvious may be delayed, as in this case, until irreversible damage is under way.

Review of Literature

Bellamy and associates,[2a] in reviewing the literature, found that in 24 of 27 cases of jaundice due to PAS the onset of prodromal fever came at least three weeks after PAS therapy was started and that in the majority the dermatitis appeared a few days after the onset of fever. Eosinophilia occurred in only 17 of these 27 cases. In the patient here reported on the temperature was higher in the evening, which at first suggested an infection. Liver function tests may be abnormal before jaundice appears. As Hensler and co-workers[3] suggest, steroids may be beneficial in drug hypersensitivity hepatitis, although they were not effective in this case. Attempted desensitization to PAS after jaundice has occurred is dangerous and rarely necessary, since other drugs are available.

Bellamy and associates [2a] have reported on a fatal case of hepatitis due to PAS. The patient was a 23-year-old girl with miliary tuberculosis and a tuberculoma of the brain, whose reaction began with fever 23 days after chemotherapy with streptomycin, isoniazid, and PAS was started. Three days later a rash appeared, and all three drugs were discontinued. Seven days later PAS therapy was resumed, and, after two more days, the fever was much higher and rash became worse, with the appearance of jaundice and subsequent death in coma. Autopsy showed miliary lesions in the liver, but the principal liver pathology was a massive necrosis involving all of the lobules, though occasionally only the central and midzonal portions were involved. The pathology was not specific for any one type of hepatitis, but the circumstances implicated PAS as the probable cause. The authors stressed the importance of recognizing fever and a skin reaction in a patient being given PAS as signs of serious drug reaction requiring prompt withdrawal of the drug.

Another fatal case of hepatitis in a patient taking PAS was reported by Allen, Beacham, and Keschner [4] in 1953. This patient developed high fever on the 26th day of PAS therapy and, three days later, a rash. Streptomycin and PAS were withdrawn. Ten days later jaundice appeared, and subsequent electrolyte determinations showed a potassium level of 2.9 mEq. per liter. Electrocardiograms showed prolonged QT intervals and depressed ST segments. The patient was treated with intravenously administered potassium, but the jaundice deepened, there was gastrointestinal bleeding, and she died in coma. Autopsy showed miliary tuberculosis involving the liver, spleen, and brain and subacute hepatic necrosis. The authors concluded that the hepatitis was, from a clinical standpoint, most likely a consequence of PAS hypersensitivity, although pathologically the hepatic necrosis was indistinguishable from that seen in epidemic hepatitis, homologous serum jaundice, and "toxic hepatitis." Hypokalemia due to PAS therapy has been reported by others. In this case the authors attributed the depressed potassium level to the nausea, vomiting, and anorexia which followed the onset of the hepatitis.

Hansen and Cleve [2b] reported a case of fatal toxic liver necrosis in a 22-year-old Negro who developed high fever, rash, conjunctivitis, lymphadenopathy, and eosinophilia 15 days after streptomycin and PAS therapy was begun. The patient's fever was higher every third day shortly after each injection of streptomycin. Streptomycin was withdrawn, but the temperature remained elevated. When PAS was also withdrawn there was a fall in temperature. PAS therapy was reinstituted seven days later, with a rise in temperature to 104 F (40 C), and, although PAS was again withdrawn, the patient died four days later after a convulsion. At autopsy there was tuberculosis of the lungs, pericardium, spleen, and lymph nodes, icterus of the sclera, and widespread hepatic necrosis. Hansen and Cleve believe that both PAS and streptomycin were the sensitizing agents. This, however, may be an instance of the nonspecific flare-up noted in one and possibly two of my previously reported cases.[1b] In the second of these, the patient was not allergic to streptomycin but only to PAS, yet she had an exacerbation of symptoms of hypersensitivity on the days her semiweekly dose of streptomycin or dihydrostreptomycin sulfate was administered.

Hensler, Singer, and Hill [3] reported a case of hepatitis, apparently due to a hypersensitivity reaction to PAS, in which liver biopsy showed pericholangitis. This patient, treated with steroids, recovered, and the authors recommend treatment with cortisone in similar cases. Their paper includes a review of the literature on hypersensitivity hepatitis caused by arsphenamine, methyltestosterone, carbasone, thiouracil, and chlorpromazine, as well as PAS.

Deaths from PAS hypersensitivity but without jaundice have occurred. Steininger and co-workers in 1954 [5] reported on a patient who developed fever to 102 F (38.8 C) 23 days after treatment with streptomycin, isoniazid, and sodium PAS, 16.5 Gm. daily, was begun. Streptomycin and PAS were withdrawn, and the fever dropped to normal for two days. A test dose of 5.5 Gm. of sodium PAS was given and fever to 103.8 F (39.9 C) developed. No further drugs were given, but symptoms continued, with nausea, vomiting, diarrhea, collapse, coma, and death. Autopsy showed periportal fibrosis in the liver with infiltration of plasma cells and polymorphonuclear leukocytes in the periportal areas. Sections of the kidneys and pancreas likewise showed numerous areas of recent scarring and infiltration, with plasma cells and polymorphonuclear leukocytes. This death was attributed to adrenal failure.

Another fatal PAS reaction without jaundice was described in 1956 [6] in a patient being given isoniazid and PAS. Fever to 103.6 F (39.7 C) appeared 27 days after chemotherapy was started. With the appearance of dermatitis three days later, the drugs were withdrawn. The liver was enlarged and sulfobromophthalein retention was increased to 16%, but there was no jaundice. In spite of treatment, including ACTH and cortisone, the patient died 17 days after the onset of fever. Autopsy showed hemorrhages through the myocardium, petechial hemorrhages in the brain, acute splenic hyperplasia, and adrenocortical degeneration. No liver pathology, except passive congestion, is mentioned in the report. This was believed to be a hypersensiti reaction of unusual and severe degree.

At the Middlesex County Sanatorium, we have had two cases of jaundice attributed to PAS therapy with recovery. The first of these has been reported previously.[1b] The patient, a 47-year-old woman, had been on streptomycin therapy, 1 Gm. twice weekly, and PAS therapy, 10 Gm. daily. The first symptom of a reaction, a papular pruritic rash, appeared 33 days after drug therapy was started, and the two drugs were withdrawn. Two days later the patient developed joint pains, headache, and small vesicles in the mouth, and the following day she had fever to 102 F (38.8 C). The temperature fell to normal in the next four days, but the rash persisted. Jaundice appeared 16 days after the rash was first seen. Laboratory findings were as follows: bilirubin, total, 2.2 mg., direct-reacting, 1.7 mg., and indirect-reacting, 0.5 mg. per 100 cc.; cephalin flocculation, 3+ in 48 hours; alkaline phosphatase, 5.4 Bodansky units per 100 cc. There was a 27% eosinophilia. The jaundice gradually faded and had disappeared 33 days after it was first noted. No further drug therapy was given because isoniazid was not then available and her minimal lesion was stable.

Our second case of jaundice believed to be due to PAS was in a 59-year-old man with a history of alcoholism. For five days he had a slight elevation of temperature, followed by fever to 101 F (38.3 C) and a macular, pruritic eruption on the face, neck, and chest. PAS and isoniazid therapy, which had been started 44 days previously, was discontinued. Jaundice appeared two days later, with eosinophilia of 46%. The patient was treated with intravenously administered glucose solution and a high-calorie diet. The alkaline phosphatase level reached 16.8 Bodansky units per 100 cc. His liver was enlarged. The jaundice gradually cleared, and the liver was no longer palpable. Isoniazid therapy was resumed, and streptomycin, 1 Gm. twice weekly, was added, but he was given no more PAS. Six months later he had a resection of the apical and posterior segments of the right upper lobe and part of the superior segment of the right lower lobe, with several blood transfusions. Three months after resection there was a recurrence of jaundice without fever or dermatitis but with nausea, vomiting, and anorexia. His alkaline phosphatase level was elevated to 8.6 Bodansky units per 100 cc. He was again treated with intravenously given glucose solution and high-calorie diet. The jaundice lasted 25 days. Streptomycin and isoniazid were not withdrawn, as this was considered to be homologous serum jaundice. Heterophil agglutination test was negative, and eosinophilia did not exceed 7%.

A third case of jaundice occurred in a patient who was taking both isoniazid and sodium PAS and had febrile reactions to both. This patient was a 35-year-old laborer, admitted Jan. 9, 1957, with far-advanced pulmonary and laryngeal tuberculosis. Chemotherapy was started Jan. 11, 1957, and consisted of isoniazid, 400 mg., sodium PAS, 12 Gm., and pyridoxine, 50 mg. daily. He developed a perineal abscess on Jan. 28, from which Staphylococcus aureus was cultured. On Jan. 30 he started running a fever to 102 F (38.8 C), which at first was attributed to the perineal abscess. However, when isoniazid and sodium PAS were withdrawn on Feb. 9, his temperature dropped to normal in 24 hours.

On Feb. 11 he was given isoniazid alone, 400 mg daily, and the next day his temperature again rose to 102 F (38.8 C). That day a sulfobromophthalein test showed 30% retention in the serum, icterus index was 8, and cephalin flocculation was 3+ in 24 hours and 4+ in 48 hours. His liver was enlarged but he had a history of alcoholism. On Feb. 14 there was an eosinophilia of 16%. Isoniazid therapy was discontinued Feb. 14, and his temperature fell to normal by Feb. 16. Two days later, his icterus index was 30 and his conjunctivas showed icterus Total serum protein level was 6 Gm. per 100 cc. with a normal albumin-globulin ratio, and total serum bilirubin was 4 mg. per 100 cc. By Feb. 20 his skin was definitely jaundiced and his total serum bilirubin level was 5.4 mg. per 100 cc. He was given a diet high in carbohydrate and protein and low in fat. A film of the abdomen failed to show gall stones. The jaundice reached its maximum Feb. 25 with an icterus index of 100, then gradually faded disappearing entirely by March 13, although the icterus index was still 16.

On March 21 he was again given test doses of isoniazid. A 50-mg. dose on that date produced no reaction, but 100 mg. the next day at 8 a. m. was followed at 3:30 p. m. by a fever of 101 F (38.3 C) Eosinophilia, which had disappeared by Feb. 18 reappeared on March 22 at a level of 13%. Cephalin flocculation was still 3+ in 48 hours. No more isoniazid was given, and his temperature fell to normal the next day. The bilirubin level was 0. mg. per 100 cc. on March 25. There was no flare-up of the jaundice with this reaction.

On March 28, a test dose of 2.6 Gm. of sodium PAS was given at 7:15 a. m. At 9:30 he had a chill with fever to 99.2 F (37.3 C). There was no eosinophilia and no recurrence of jaundice, the icterus index being 8 as compared to 16 on March 13.

Graduated doses of streptomycin started on April 3 gave no reactions, and on April 5 a regular twice-weekly schedule of streptomycin therapy with oxytetracycline (Terramycin), 3 Gm. daily, was started and continued without difficulty.

On July 5, 1957, isoniazid desensitization was started, beginning with 1 mg. three times a day and increasing gradually to 100 mg. three times daily. This dosage, with streptomycin (1 Gm. twice weekly), was then continued without further reactions. and the oxytetracycline was withdrawn. Sulfobromophthalein determinations during isoniazid desensitization varied from 5% to 15% retention; serum bilirubin level remained normal, and the alkaline phosphatase level on July 9 was 5 units per 100 cc. In this case, it is not known whether PAS or isoniazid hypersensitivity caused the jaundice. The patient has, at the time of writing, continued to take isoniazid and streptomycin without further reactions. He underwent staged bilateral lung resections with smooth convalescence.

Hepatitis due to isoniazid has been reported,[7] and Cohen and Lawrence[8] have recently reported on two patients who showed hypersensitivity reactions to PAS and reproduction of a similar clinical picture after being given a test dose of isoniazid. Their paper cites two other reports of hypersensitivity to both PAS and isoniazid and seven reported cases of hypersensitivity to both PAS and streptomycin.

A former patient at this hospital who took both isoniazid and streptomycin was admitted to the Massachusetts General Hospital for study of fever of unknown etiology. In addition to fever he had shaking chills, clinical jaundice, and disturbed hepatic function. When isoniazid was withdrawn, the jaundice subsided and he became afebrile. Isoniazid was readministered on two subsequent occasions with recurrence of fever and elevation in serum bilirubin level, as well as increased sulfobromophthalein retention.

Hayes and Weiss[9] in 1953 reported two cases of jaundice in patients taking PAS. After disappearance of the jaundice, these two patients were desensitized by small and gradually increasing doses of the drug. Considering the potential seriousness of PAS hepatitis, such desensitization seems hazardous.

Jaundice due to streptomycin hypersensitivity has not been reported on as far as I know, but in a patient taking streptomycin and PAS, who developed hepatitis with fever and dermatitis, an attempt six months after symptoms subsided to desensitize to streptomycin resulted in a rise of sulfobromophthalein retention and a recurrence of rash on the hands.[10]

Reactions to PAS have been described[9] in which there was no jaundice but increased sulfobromophthalein retention and positive cephalin flocculation tests, and several such cases have been observed at this hospital.

One of these was in a 73-year-old man who, on Nov. 19, 1956, while taking isoniazid and sodium PAS, had a reaction with fever to 103 F (39.4 C). Sodium PAS was immediately withdrawn. Several days later he developed an itching macular rash, involving the trunk and arms, which gradually faded. On Nov. 27 his icterus index was 10, and on Dec. 3 it was 13.4, with a cephalin flocculation test showing 2+ in 24 and 4+ in 48 hours. By Dec. 6 his sulfobromophthalein retention was 50%. On Dec. 26 his cephalin flocculation test showed 1+ in 24 and 2+ in 48 hours. Another sulfobromophthalein test on March 3, 1957, showed no retention of dye. He has been continued on isoniazid therapy plus twice-weekly administrations of streptomycin without further reactions.

Summary

A fatal case of hepatitis was found to be due to hypersensitivity to aminosalicylic acid (PAS). A review of the literature on PAS reactions revealed five fatal ones, three of which were due to liver involvement. Four nonfatal cases of drug hypersensitivity hepatitis were seen; in one and possibly two of these, isoniazid was the offending drug.

Fever without eosinophilia or a rash may be the only symptom of a beginning PAS hypersensitivity reaction. Arthralgia is another early symptom. By the time a rash has appeared and before the patient is jaundiced, irreversible and fatally progressive hepatitis may be under way. Unexplained fever in a patient taking PAS requires immediate withdrawal of the drug, and the drug should be withheld until a hypersensitivity reaction can be ruled out. Test doses of PAS, unless minute, are dangerous. The physician using PAS in the treatment of tuberculosis must be familiar with the early symptoms of these serious PAS reactions if he is to forestall tragic consequences.

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ASIAN INFLUENZA IN SANTIAGO AND CONCEPCIÓN, CHILE

OBSERVATIONS ON THE EPIDEMIC DURING JULY AND AUGUST, 1957

The Influenza Study Group, Armed Forces Epidemiological Board; The Committee on Influenza, National Health Service, Santiago, Chile; Members of the Faculty of Medicine, University of Concepción, Concepción, Chile
and
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Influenza was first noted in the north of Chile in the second week of July, 1957. A week later it was present in Santiago and subsequently in the central and southern provinces of the country. It was identified by serologic studies which also showed that the majority of the patients with pneumonia developed antibodies against the A/Japan/305/57 influenza virus. The sharp increase of pneumonia in Santiago on Aug. 2 came 10 days after the sharp increase of influenza cases. The twofold increase in deaths during the epidemic was mostly attributable to influenza and pneumonia, and the marked increase in deaths from pneumonia resulted primarily from the increase in total cases rather than from any increase in the proportion of cases that could not be treated successfully. The organism most frequently isolated from fatal cases was Staphylococcus pyogenes. The concerted study of this epidemic gave an early, relatively complete, and valuable picture of the characteristics and potentialities of Asian influenza.

In June, 1957, the Armed Forces Epidemiological Board through its Commissions on Acute Respiratory Diseases, Influenza, and Streptococcal Diseases organized an Influenza Study Group to plan and carry out studies on the epidemic of Asian influenza which at that time was essentially confined to the Far East but whose appearance in the United States was expected. The primary objective of the study group was to obtain concise epidemiologic, clinical, laboratory, and pathological data about influenza caused by the new strain of virus and, preferably, to obtain these data before influenza became epidemic in the United States. Such early information would permit more effective plans to be made in anticipation of the epidemic than were possible with the fragmentary reports then available.

Consideration of possible areas for study directed attention to Chile. Normally the pneumonia rate is high in Chile and if influenza occurred during July and August, the Chilean winter season, there would be opportunity to observe the current epidemic in an area where the population might be expected to have a high rate of bacterial pulmonary complications. Consequently, when influenza was reported to be epidemic in Chile arrangements were made through the Pan American Sanitary Bureau for the Influenza Study Group to observe the epidemic in cooperation with the Chilean Committee on Influenza. The Chilean committee had been organized in Santiago by the National Health Service in July and an active investigation was under way when the Influenza Study Group arrived on Aug. 8, 1957. Through formal weekly meetings and close cooperation between individual members of the two groups joint observations of the epidemiologic, clinical, virological, bacteriological, serologic, and pathological features of the epidemic in Santiago were made. In addition, clinical, bacteriological, and pathological data regarding pneumonic complications of influenza were obtained in Concepción, Chile, by members of the faculty of medicine, University of Concepción.

This report presents the results of the above observations made during the month spent by the Influenza Study Group in Chile. Other aspects of the epidemic have been reported elsewhere.[1]

Members of the Influenza Study Group participating in this study are Harold B. Houser, M.D. (*field director*), department of medicine, State University of New York Upstate Medical Center, Syracuse, N. Y.; Willard C. Schmidt, M.D., Cleveland City Hospital and departments of pediatrics and preventive medicine, Western Reserve University School of Medicine, Cleveland; Albert V. Hennessy, M.D., Ward D. Peterson, M.A., and Fred M. Davenport, M.D. (director, Commission on Influenza, Armed Forces Epidemiological Board), department of epidemiology and virus laboratory, School of Public Health, University of Michigan, Ann Arbor.

Members of the Committee on Influenza are Abraham Horwitz, M.D. (Chairman), sub-director normativa, National Health Service, Conrado Ristori, M.D., chief, department of epidemiology, National Health Service; Eduardo Dussert, M.D., professor of bacteriology, and Oscar Avendano, M.D., virologist, Bacteriological Institute; Roque Kraljevic, M.D., director, infectious disease service, Ramon Barros Luco Hospital; Miguel Ossandon, M.D., pathologist, San Juan de Dios Hospital; Anibal Ariztia, M.D., professor of pediatrics, Calvo MacKenna Childrens Hospital; and Horacio Boccardo, M.D., chief, and Manuel Borgoño, M.D., sub-department of infectious diseases, National Health Service.

Members of the Faculty of Medicine participating in this study are Ivar Hermansen, M.D., dean and professor of medicine; Rafael Darricarrere, M.D., professor of bacteriology; Hernan San Martin, M.D., professor of preventive medicine; and R. Scheurmann, M.D., professor of pathology.

The Influenza Study-Group was under the auspices of the Armed Forces Epidemiological Board and its Commission on Acute Respiratory Diseases, Commission on Influenza, and Commission on Streptococcal Diseases and was supported by the Offices of the Surgeons General, Departments of the Army and Air Force, Washington, D.C.

Epidemiology

Santiago province has a population of about 2 million, with 1,500,000 living in the modern city of Santiago. Factors, such as malnutrition, crowding, chronic illness, and inadequate shelter, that presumably are important in increasing the incidence and severity of respiratory diseases are present to a considerable degree. Although rapid strides have been made during the past years in reducing deaths from acute and chronic infections, respiratory infections still account for about 20% of the annual deaths in Chile.

Under the National Health Service almost the entire population receives hospital care free of direct charge, most of the physicians work in some capacity for the health service, and a standard, rapid, and effective method of vital statistics reporting exists. These circumstances permitted rapid collection of epidemiologiv data concerning the epidemic.

Influenza was first noted in the north of Chile in the second week of July. A week later it was present in Santiago and subsequently in the central and southern provinces of the country. No precise information on the attack rate for influenza was obtained, although in Concepción, a city of about 100,000 people 300 miles south of Santiago, a survey of a 15% sample of the population at the end of the second week of the epidemic indicated that 25% had had influenza during the prior two weeks.

A reflection of the pattern of the epidemic in Santiago was obtained by examining the daily records of the emergency service of the Hospital R. Barros Luco. This hospital is located in one of the poorer sections of the city and its major source of patients is from this section. The daily number of cases of influenza and pneumonia seen in the emergency service from July 14 to Aug. 31 is presented in figure 1. There was a sharp increase in cases of influenza about July 23 and it was not until Aug. 14 that the number of cases had decreased to the level observed before July 23. Although an irregular and slight increase in the curve for pneumonia cases was apparent at about the same time as the increase in influenza cases, it was not until Aug. 2, 10 days after the sharp increase in influenza, that a considerable increase in the number of cases of pneumonia occurred. That the increase in pneumonia cases was related to the influenza epidemic was indicated both by the history of prior influenza in patients with pneumonia and by demonstration of antibody increases to the Asian strain of influenza virus in patients with pneumonia. Also, the number of cases of pneumonia at the Barros Luco Hospital and throughout the city during this period was greatly in excess of previous years. No information on the attack rate for pneumonia was obtained. Although the patients with pneumonia who were seen in the emergency service of the Barros Luco Hospital came from the same general area as the patients with influenza, the 4 to 1 ratio of influenza to pneumonia should not be interpreted as representative of the relation of the one to the other.

Since the Barros Luco Hospital had no general pediatric service, children were seen infrequently in the emergency service. When only the population over the age of 10 years was considered, it was apparent that by age group the attack rate was proportionately higher in persons less than 30 years of age than in those 40 or more years old. However, the occurrence of pneumonia was lower in the 10-to-19-year group and higher in the 60 years and over group than would be expected from the population distribution, while the occurrence in the decades between 20 and 59 years was proportionate to the population. The age distribution of patients with pneumonia admitted to two general hospitals, Aguirre and Barros Luco, during the epidemic was similar to that of normal previous years, indicating that the increase in hospitalized patients with pneumonia was proportional in all age groups.

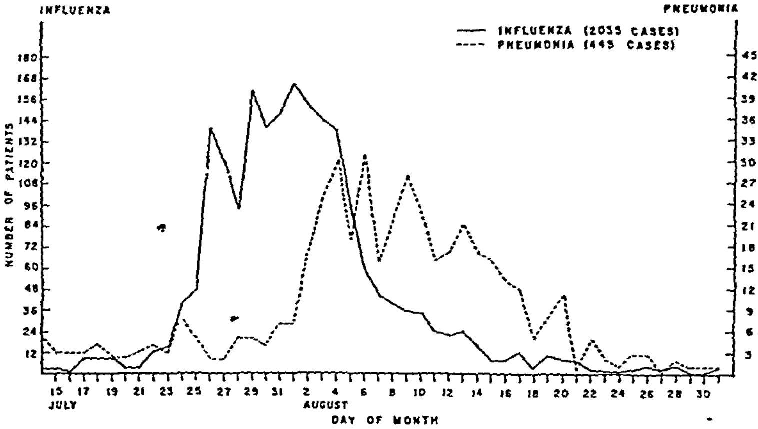

Fig. 1.—Number of patients with influenza or pneumonia seen daily in emergency service of R. Barros Luco Hospital, Santiago, Chile between July 14 and Aug. 31, 1957.

The number of burials in the major Santiago cemeteries between July 30 and Aug. 21 was 2,599. It was estimated that this represented at least 98% of the total burials in the city. The daily record of the burials showed that they began to exceed the expected number on July 30 and remained above this number until Aug. 21. The peak day of burials (179), Aug. 6, was also the day on which the largest number of patients with pneumonia were seen at the emergency service of the Barros Luco Hospital (fig. 1). A curve made from the number of daily burials is similar in shape and duration to that of the pneumonia diagnoses in figure 1. In

August, 1956, the daily average number of deaths in Santiago was 52. Therefore, 1,196 deaths would have been expected in the same period in which at least 2,599 occurred. This represents an approximate increase of 2.2 times.

More precise information was available through Aug. 17 from death certificates sent to the National Health Service. The mortality rates attributed to grippe (influenza) and pneumonia and for all causes were similar through the week ending July 27 in both 1956 and 1957. The rate for deaths from all causes increased from 23.9 per 100,000 during the week July 21-27, 1957, to 41.6 in the week July 28-Aug. 3, while in 1956 the rates for the same two weeks were 23.2 and 24.2 respectively. The following week, Aug. 4-10, 1957, was the peak week for deaths with a rate of 72 that compared to a rate of 21.2 in the same week of 1956. The rate dropped to 53.7 in the week of Aug. 11-17, 1957. Certified deaths from grippe and pneumonia from July 14 to Aug. 17 occurred at a weekly rate of about 3 per 100,000 in 1956. In 1957, this same rate was present for the first two weeks of this period but increased to weekly rates of 13.5, 36.7, and 24.8 during the last three weeks. The numbers of certified deaths from grippe and pneumonia during these latter three weeks are shown by age group for both 1956 and 1957 in figure 2. There were 886 more deaths from grippe or pneumonia in 1957 than there were in 1956—an increase of approximately 7.6 times. The increase, apparent in all age groups, was most marked in the older age groups. This is again illustrated in figure 3, where mortality rates for all causes, as well as grippe and pneumonia, are shown by age group for the same three weeks. The highest total death rates occurred in children less than one year old and in the older age groups. However, the increase in death rates from all causes was from 2 to 3 times in each age group with the exception of those under one year of age who had about a 1.5 increase in rate. Thus, there was little change in the percentage distribution of total deaths by age group during these three weeks. The only causes of death, aside from respiratory diseases, that showed significant increase during this period were those attributed to involvement of the circulatory system and to parasitic and infectious diseases, although there was a trend in all classifications toward increase.

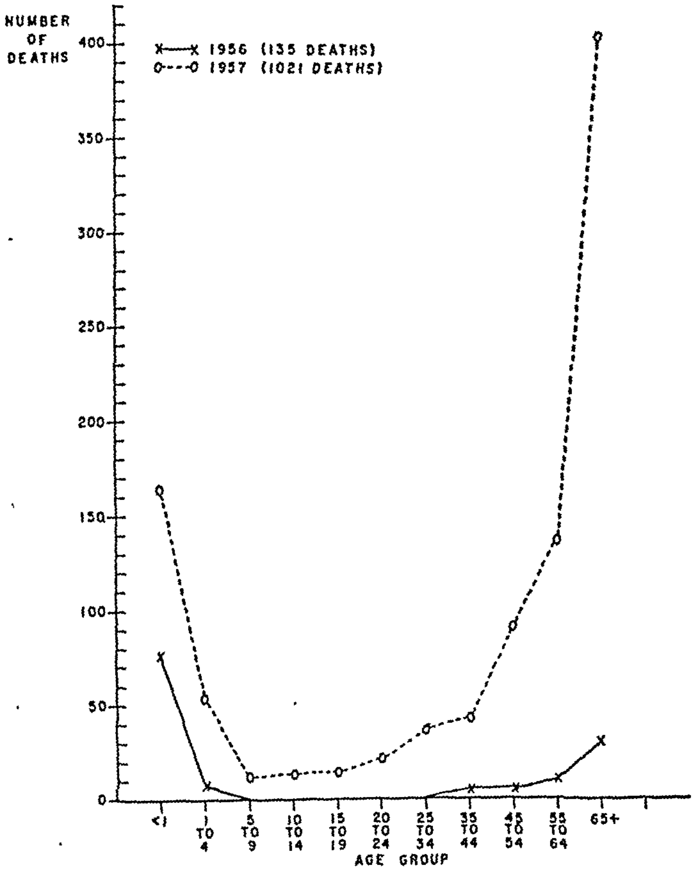

Fig. 2.—Age distribution of deaths in Santiago from grippe and pneumonia between July 28 and Aug. 17, 1957, compared to same period in 1956.

Clinical Observations

The clinical picture of uncomplicated influenza was not unusual and conformed closely to classic descriptions of influenza A.[2] Except for less prostration, children appeared to have courses of illness similar to those of adults.

A clinical picture of nonfatal pneumonia in adults was obtained from observations on 57 patients admitted to the infectious disease pavilion of the R. Barros Luco Hospital, most of whom gave a history of preceding influenza. The day after onset of influenza that symptoms of pneumonia appeared is as follows: same day, 2 cases; 1st day after, 2; 2nd day, 5; 3rd day, 10; 4th day, 5; 5th day, 5; 6th day, 6; 7th day, 4; 8th day, 3; 9th day, 2; 10th day, 1; 11th day, none; 12th day, 1; 13th day, none; 14th day, 1; day unknown, 10. Serologic studies confirmed that the majority had had influenzal infections.

The onset of pneumonia was usually characterized by appearance of pleuritic pain, chills, return of feverishness if it had disappeared, and change in character and amount of sputum. Chest roentgenograms were available in only limited numbers, so that descriptions of pulmonary involvement were dependent on physical diagnosis and fluoroscopic examinations. Frequently, physical signs of crepitant rales, rhonchi and wheezes, and changes in breath sounds were found bilaterally, but fluoroscopic examination revealed unilateral involvement. By fluoroscopy 43 of the 57 patients had unilateral pneumonia and 14 had bilateral involvement. When the pneumonia was unilateral more than one lobe was frequently involved. The usual signs of consolidation were present in the majority of the patients. Empyema was infrequent, but pulmonary abscesses were occasionally observed.

Laboratory data were sparse. The greatly increased number of patients and workload during the epidemic precluded routine laboratory studies that would have been done under more normal circumstances. The bacteriology in the pneumonia cases was difficult to interpret, since many of the sputum cultures were obtained after two or more days of antibiotic treatment. Although Staphylococcus (Micrococcus) pyogenes var. aureus was reported most frequently in this group of patients, the physical signs, course of illness, and response to treatment were more consistent with a pneumococcic or streptococcic etiology in the majority of cases. With improved techniques, a subsequent series from the same hospital did show a predominance of hemolytic streptococci and pneumococci in the sputum cultures.[1]

In the opinion of the physicians at the Barros Luco Hospital, the postinfluenzal pneumonia observed was quite different from the lobar pneumonia seen in past years. The patients were sicker and more dyspneic; cyanosis was more frequent; and response to treatment was not as uniform. The majority of the patients received tetracycline-oleandomycin (Sigmamycin), but many received penicillin, penicillin and streptomycin, or other antibiotics alone or in combination. The median duration of treatment was five days, with the shortest being 3 and the longest 13. The response of fever to treatment was similar without regard to the drug used. Forty-eight hours after start of treatment about 20% still had a temperature above 100 F (37.8 C). The length of hospitalization ranged from 6 to 35 days, with a median stay of 10 days. In most instances the pneumonia had not resolved completely at the time of discharge.

Less detailed information was obtained from children with pneumonia. At the Roberto del Rio Hospital, the pneumonia in children was a severe type of bronchopneumonia, but in most cases the temperature returned to normal in 36 hours along with clinical improvement. Penicillin, streptomycin, and tetracycline were routinely employed in treatment.

The case fatality rates of pneumonia in three different hospitals during the epidemic are compared to the rates in the same hospitals in previous years in figure 4. There was an increase in fatality rates in each of the hospitals, but this increase was not alarming. There was a marked increase in the total number of pneumonia cases, with an accompanying absolute increase in deaths from pneumonia, but the proportion of fatal cases was not markedly altered. At the Roberto del Rio Hospital, the number of deaths in infants from pneumonia was 4.9 times the average for 1954-1955-1956 and in children was 4 times the average. However, the case fatality rate increased only 1.5 times in infants and 1.1 times in children. Seventy-six per cent of the deaths occurred within 24 hours of hospital admission, and the period of illness preceding hospitalization ranged from a few hours to 15 days, with an average of 4.5 days. At the Aguirre, a general hospital, the increase in fatality rate was 1.3 times the average for the three previous years. The increase, if significant, may be explained by the fact that many patients, hospitalized with chronic disease, contracted influenza and developed pneumonia while in the hospital. Also, in at least 52% of the deaths important disease conditions other than pneumonia were present (i. e., carcinoma, heart diseases) and verified by autopsy. There were more deaths in the younger adults, however, and this was also true in the Barros Luco Hospital. In this hospital the rate during the epidemic was 2.8 times that of the average rate for the entire years of 1955 and 1956, but still 93% of the patients did not die. Of a total of 24 deaths from pneumonia, 15 were within the first 24 hours after admission. Eleven of the 24 had chronic disease or other contributory cause for death.

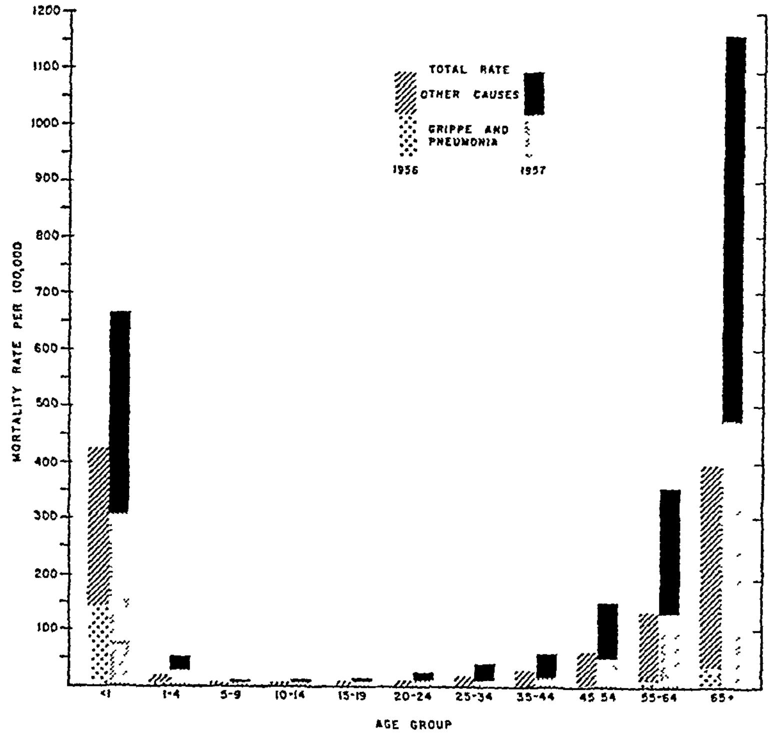

Fig. 3.—Mortality rate in Santiago by age for grippe and pneumonia, and all causes July 28 to Aug. 17, 1957, compared to same period in 1956.

Clinically, fatal cases of pneumonia fell into three categories. The first was composed of pneumonia with a rapid fulminating course. Death occurred as early as two days after the onset of illness and not infrequently within a few minutes to hours after admission to hospital. The patients were usually moribund on admission, in shock, cyanotic, tachypneic, and expectorating bright bloody or blood-tinged frothy sputum. There was marked involvement of the lungs evidenced by moist and crepitant rales throughout the lung fields and extensive signs of consolidation. Response to oxygen, antibiotics, arterenol, and intramuscularly given cortisone was uniformly poor. No particular bacteria were associated with these cases and, although Staphylococcus pyogenes was most frequently cultured, in some instances normal flora were reported. It was felt that these possibly represented an influenzal type of pneumonia with the role of the bacteria not defined. This type of pneumonia represented not more than 25% of the fatal cases at the Barros Luco Hospital.

The majority of the fatal cases fell into the second group, which consisted of cases more typical of bacterial pneumonia except that the symptoms and signs were more severe than the usual pneumonia, pulmonary involvement was frequently bilateral or multilobar, cyanosis and shock were present, and the course was progressively downhill. Many of the deaths in this group occurred early after admission in patients moribund at the time of admission. A variety of organisms were isolated from the sputums of these patients, but Staphylococcus pyogenes predominated. The presence of chronic illness, the late months of pregnancy, and the puerperium appeared to worsen the prognosis. Purulent meningitis and empyema were present occasionally in this group.

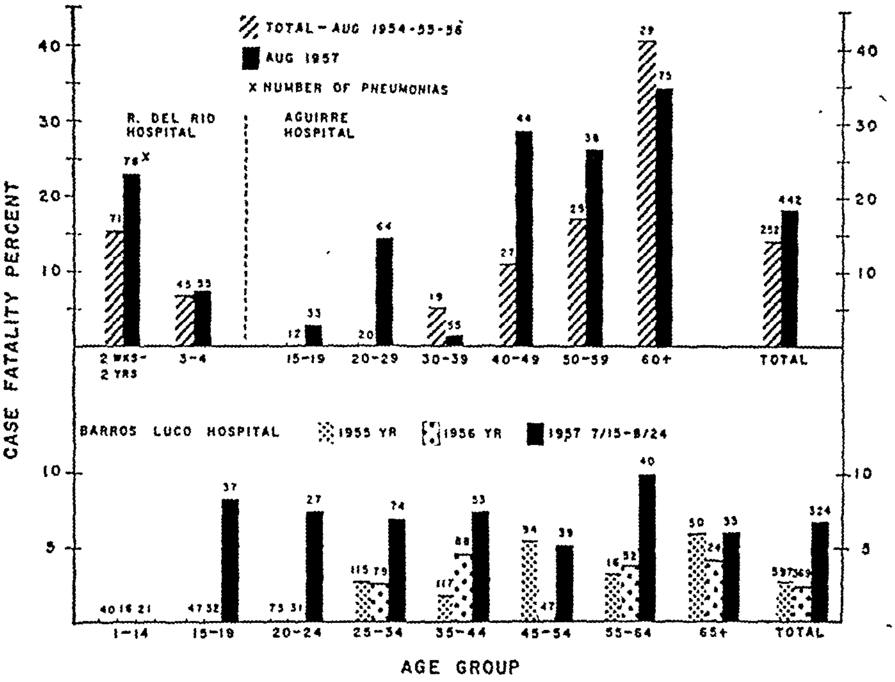

Fig. 4.—Case fatality rates by age for pneumonia in patients admitted to three hospitals in Santiago, Chile, during the epidemic of Asian influenza, July and August, 1957, compared to rates during previous years.

The third group consisted of a small percentage of the fatal cases in which death occurred after a relatively long period of illness due to complications of staphylococcic pneumonia such as pulmonary or metastatic abscesses.

Bacteriology

The bacterial organisms isolated from sputums of patients with pneumonia varied among the hospitals from which bacteriological data were available. Differences in laboratory techniques, in the interval between the collecting and implanting of specimens, and in length of time of antibiotic therapy before cultures were obtained might have accounted for some of the variation. Pneumococci were isolated most frequently from sputum samples at the Aguirre Hospital. Staphylococcus pyogenes and Klebsiella were less frequently encountered. At the Barros Luco Hospital, Staphylococcus pyogenes was the pathogen isolated oftenest from sputum cultures; hemolytic streptococci and pneumococci were also isolated. However, normal throat flora were most frequently reported. At Concepción, Staphylococcus pyogenes, pneumococcus, and Hemophilus influenzae were isolated with equal frequency from patients with pneumonia in the Regional Hospital and one of the three was present in the majority of the patients.

Bacteriological data from autopsied cases at the Barros Luco and Aguirre hospitals in Santiago and the Regional Hospital, Concepción, are presented in table 1. Of 19 organisms isolated from the 13 cases at Concepción, Staphylococcus pyogenes was found 10 times while at the Barros Luco Hospital these organisms were present 7 times in a total of 15 organisms isolated from 1 patients. The large number of Klebsiella reported from the Aguirre Hospital was in striking contrast to the other hospitals. Seven of 21 randomly selected Klebsiella strains were found to be virulent for mice, and 2 of these 7 strains were demonstrated to be type B organisms. The remaining strains gave negative capsular swelling reactions with types A, B, and C antiserums. Aside from these organisms, staphylococci pyogenes and pneumococci were predominantly present. Of 15 cases for which autopsy protocols were available at the R. del Rio Hospital, 4 or 26% had pulmonary abscesses and 6 or 40% had empyema. This is an indication that staphylococcic pneumonia was the predominant type in the fatal cases in this pediatric hospital.

Ten strains of Staphylococcus pyogenes isolated at the Aguirre Hospital were tested for antibiotic resistance with medium concentrations of chlortetracycline, oxytetracycline, tetracycline, chloramphenicol, dihydrostreptomycin, penicillin, and erythromycin. All were sensitive to erythromycin. One strain was sensitive to all antibiotics but the remainder showed resistance to all antibiotics except erythromycin, with the exception of two strains sensitive to chloramphenicol. In Concepción, antibiotic sensitivity studies were done on nine strains of Staphylococcus pyogenes isolated from lungs at autopsy. Essentially all the strains were resistant to penicillin, streptomycin, and sulfadiazine; about one-half of the strains were resistant to the broad-spectrum antibiotics; and two of the nine strains were resistant to erythromycin.

Serologic Studies

Influenza viruses found to be similar to the A/Japan/305/57 strain were isolated from patients with influenza and from the lungs in fatal cases of pneumonia. Hemagglutination-inhibition (HI) tests with a ferret-mouse passage line of the A/Japan/305/57 strain on acute and convalescent serums from patients with influenza also confirmed that the illnesses were caused by a member of the Asian family of type A influenza viruses. Complement-fixation (CF) tests using A/Japan/305/57 egg line strains of virus and HI tests were done on paired serums from 70 patients at the Barros Luco Hospital. Serums were treated with periodate before the HI test. Adequate clinical data and convalescent serums drawn more than five days after the onset of influenza were available for all 70 patients, of whom 24 had a clinical diagnosis of influenza and 46 had a diagnosis of postinfluenzal pneumonia. Forty-six per cent of the cases of influenza showed diagnostic increases by CF only, 8% showed increases by HI only, and 21% showed antibody increases by both techniques. An additional patient had high titers by both tests, so that a presumptive serologic diagnosis of influenza was made. Thus, 79% of the clinically diagnosed influenza cases were confirmed serologically. Of the 46 cases of pneumonia, 11% showed diagnostic increases by CF only, 28% were positive by HI only, and 37% were positive by both techniques. Since four (9%) additional patients had titers by both techniques sufficiently high for a presumptive diagnosis, in 85% of the patients with pneumonia diagnosis of prior illness with influenza was confirmed. Complement-fixing antibody was always present by the eighth day of illness. Hemagglutination-inhibiting antibody was not detected in one individual for as long as the 16th day after onset of influenza. Hemagglutination-inhibiting antibody was never detected in the absence of complement-fixing antibody. Therefore, a demonstrable increase in CF antibody in convalescent blood serums was more frequent in influenza patients and an increase in HI antibody in the pneumonia patients, since the initial blood serum was usually obtained later after onset of influenza in the patients with pneumonia.

Pathology

Protocols of the gross autopsies of all patients with pneumonia who died and were autopsied at the Regional Hospital in Concepción and at the infectious disease pavilion of the Barros Luco Hospital during the epidemic were reviewed and a limited number of microscopic sections of autopsy material were examined. In addition, observation of gross autopsy material in the R. del Rio Childrens Hospital and the Aguirre Hospital was made.

Of the 49 patients (27 patients from Concepción and 22 from Santiago) whose protocols were reviewed, pneumonia, or its complications, was directly responsible for death. Seventeen patients had chronic pathological states that could have contributed to death, another four were in the puerperium, one was in the eighth month of pregnancy, and one had recently had a gastrectomy. The remaining 26 patients had no gross evidence of contributory causes of death. A summary of the gross descriptions of the lungs of these 49 patients is presented in table 2. Ages ranged from 3 days to 80 years, with a preponderance of cases from the middle decades. No difference in the type of changes found in the lungs at postmortem examination could be related to age. The description of acute hemorrhagic tracheobronchitis was confined to the Concepción series, with one exception. Hemorrhagic bronchopneumonia was described with equal frequency in the two centers. Gray hepatization was described only in Santiago. Eleven of the 15 patients with pulmonary abscesses were from Concepción. Acute emphysema, noted in eight cases from Concepción, was not described in Santiago.

TABLE 1.—*Organisms Isolated at Autopsy from Lungs of Patients Dying with Pneumonia in Aguirre and Barros Luco Hospitals, Santiago, and the University Hospital, Concepción, Chile*

Organism	Aguirre (29 Pt.)		Barros Luco (11 Pt.)		Concepción (13 Pt.)		Total
	Only Organism Isolated	Other Organism Present	Only Organism Isolated	Other Organism Present	Only Organism Isolated	Other Organism Present	
Staphylococcus pyogenes var. aureus	2	7	3†	3	3	4	22
Staphylococcus pyogenes var. albus	...	...	...	1	1	2	4
Diplococcus pneumoniae	...	4	1‡	1§	1	...	7
Hemolytic Streptococcus	...	...	2	1	...	...	3
Klebsiella species*	12	14	...	...	2‖	1	29
Hemophilus influenzae	...	...	...	1	...	...	1
Pseudomonas species	...	...	...	1	...	...	1
Proteus species	...	...	1	...	...	3	4
Escherichia coli	1	1	...	...	...	2	4
Enterococcus	...	1	...	...	...	...	1
Candida albicans	...	1	...	...	...	...	1
Total	15	28	7	8	7	12	77

* Includes Aerobacter species according to Kauffmann.[3]

† From sputum in one instance. ‡ From spinal fluid. § From brain.

‖ Mouse virulent.

Whether or not these differences were real or the result of a difference in descriptive terms is unknown, but it is probable that they reflected a differing bacterial etiology of the pneumonia.

Documentation of primary influenzal pneumonia in any of the observed cases was difficult. Virus was recovered from the lungs of two patients from the Barros Luco Hospital. Each had been ill with pneumonia for two days. One had had influenza for five days, while the time of onset of influenza in the other was unknown. Neither had bacteria isolated from the lung. The gross description of the lungs of the two patients conformed to that of numerous other cases.

The few microscopic sections available showed one or more of the following findings: denudation of the trachea of epithelium, acute pulmonary abscess formation, focal dilatation of alveolar spaces and rupture of alveolar septa, extensive acute hemorrhagic pneumonia, and ulcerative bronchiolitis. In general, the sections presented the histological changes seen in pneumonia or bronchopneumonia of bacterial etiology, and pneumonia of viral etiology could not be confirmed or denied.

TABLE 2.—*Summary of Gross Pathological Descriptions of Lungs of Forty-nine Patients Dying with Pneumonia During t Influenza Epidemic in Concepción and Santiago, Chile, July and August, 1957*

	No. of Findings by Age Group						
Gross Pathological Description	3 Days (1 Pt.)	10-19 Yr. (5 Pt.)	20-39 Yr. (19 Pt.)	40-59 Yr. (11 Pt.)	>60 Yr. (10 Pt.)	Unknown (3 Pt.)	Total (49 Pt
Hemorrhagic tracheobronchitis	...	2	6	7	3	2	20
Acute tracheobronchitis	1	2	9	4	3	1	20
Necrotic tracheobronchitis	...	...	1	...	1	...	2
Hemorrhagic bronchopneumonia	...	2	7	5	3	2	19
Bronchopneumonia	1	3	5	2	1	1	13
Gray hepatization	...	...	2	1	3	1	7
Red hepatization	...	...	1	...	...	...	1
Acute emphysema	...	1	2	3	2	...	8
Abscess or abscesses	...	1	8	2	4	...	15

Comment

The obtaining of reliable information concerning the present epidemic of Asian influenza in a population with a high attack rate and high incidence of bacterial complications, particularly pneumonia, afforded an early opportunity to assess the potentialities of the epidemic. There had been obvious concern based on the emergence of a new strain of influenza virus to which immunity appeared to be lacking in the vast majority of the population. Early reports, mostly in the press, indicated considerable mortality associated with the epidemic in several populations. These points increased the urgency of getting reliable data so that adequate and intelligent planning could be made in anticipation of influenza becoming epidemic in the United States. The specter of 1918 and 1919 haunts us all in such a situation.

Data obtained in Chile indicated that the increased mortality occurred in a pattern that was usual with influenza and not unusual as in the 1918 epidemic.[4] The very young and the elderly contributed predominantly to the increased number of deaths. Thus, the skewed U curve of influenza and pneumonia deaths as shown in figure 2 occurred Chile and not the W-shaped curve of 1918 that r sulted from a high mortality rate in the midd decades of life. There was an increase in deaths all age groups in Chile, however, and as a result our observations it was apparent that young adul would also probably experience an increased mo tality rate wherever Asian influenza became ep demic. This, in fact, has happened in the Unit States during the fall of 1957 and has also be reported in England.[5] However, it should be e phasized that although the postinfluenzal pne monia in Chile was more severe than the usu pneumonia and response to treatment was slowe case fatality rates did not increase markedly a the pneumonia did respond to treatment. T marked increase in the number of deaths fro pneumonia was primarily the result of a greatl increased number of cases of pneumonia rathe than a great increase in cases that could not b treated successfully.

Another point to be emphasized is that influenz did not predispose to pulmonary infection with a particular organism. Pneumococci, beta-hemolyti streptococci, H. influenzae, and Staphylococcus pyo genes were the predominant bacteria associate with pneumonia, and the proportion of each o these varied in different population groups. Thi variation possibly reflected the carrier rates for th organisms in the populations. In addition, Klebsiell organisms were reported frequently in one hospital Since the majority of the Klebsiella isolated were mouse avirulent, the significance of the frequent isolation was not clear. However, the presence of some mouse virulent strains indicated that Klebsiella were important etiological organisms in thi hospital. Pneumococcic, streptococcic, and H. influenzae pneumonia, in general, responded well to treatment unless the patient was moribund on admission. Staphylococcic pneumonia, on the other hand, did not do as well since at least one-half th deaths about which we had information were the result of infections with Staphylococcus pyogenes. However, since the proportion of cases of staphylococcic pneumonia was high in some groups of patients, many patients with this type of pneumonia did respond to antibiotic treatment. The high case fatality rates for pneumonia in some hospitals such as the Aguirre and at Concepción, where 28% of hospitalized patients with pneumonia died, were probably the result of a greater number of infections due to Staphylococcus pyogenes. Most of the strains of Staphylococcus pyogenes tested were resistant to penicillin and broad-spectrum antibiotics, although many were sensitive to erythromycin.

Staphylococcic pneumonia, the occasional poorly responding pneumonia due to other bacteria, pneumonia in which there was delay in treatment, and bacterial pneumonia occurring in chronically ill or other patients with poor prognosis accounted for the majority of the fatal cases about which we had information. Approximately one-third of the deaths occurred within the first 24 hours of hospitalization. Frequently there had been delay in seeking medical or hospital care on the patients' part and this possibly contributed to their deaths. It was also apparent that women in the latter months of pregnancy and the puerperium, chronically ill patients, infants, and patients with recent major surgery had a worse prognosis for pneumonia. Bacteriological, pathological, and clinical information supported the probable bacterial nature of most of the fatal cases of pneumonia and the course was not too unusual when all factors effecting the course were considered. However, a bacteriological etiology of acute fulminant pneumonia that accounted for a smaller proportion of fatalities was not clearly defined. In these cases, the influenzal and pneumonic processes seemed continuous. Frequently, it was not possible to isolate pathogenic organisms. Response to treatment in these cases was uniformly poor despite relatively adequate supportive measures, and the course was rapidly downhill with cyanosis, shock, and death within a few hours after admission. It is possible that these illnesses were primary influenzal pneumonia.

Evaluation and interpretation of the data from Chile in relation to the appearance of an epidemic of Asian influenza in the United States of similar magnitude during the height of the respiratory disease season had to be tempered by consideration of the differences between Chile and the United States in those socioeconomic factors accepted as contributing to increased morbidity and mortality from pneumonia. Nevertheless, it was felt that some of the information lent itself to application here and that an early, relatively complete picture of the characteristics and potentialities of Asian influenza was obtained. This picture has been of value.

Summary

Epidemic Asian influenza in Santiago and Concepción, Chile, during July and August, 1957, was accompanied by a high rate of pulmonary complications. A twofold increase in deaths during the epidemic was coincidental with the increase in pneumonia and most of the increase in deaths was attributable to influenza and pneumonia. The very young and the elderly contributed predominantly to the fatalities, but there was an increase in deaths in all age groups. Postinfluenzal pneumonia was more severe than the "typical" pneumonia of past years but responded relatively well to antibiotics with only a slight increase in hospital fatality rates. Although a variety of organisms was associated with the fatal cases of pneumonia, Staphylococcus pyogenes was most frequently isolated. A small proportion of fatalities was probably the result of primary influenzal pneumonia. Serologic studies demonstrated that the majority of the patients with pneumonia developed antibodies against the A/Japan/305/57 influenza virus.

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We wish to thank Dr. Guillermo Valenzuela, director-general, National Health Service of Chile, whose cooperation permitted the joint observations in this report to be made. Dr. Eugenio Suarez, director, Bacteriological Institute, graciously made laboratory space available. Much extra time and effort was willingly given us by many and we wish to thank Drs. Jose Perroni, Ernesto Pearson, Mario Allende, and Miss Elisa Gomez Contreras of the Infectious Disease Pavilion, R. Barros Luco Hospital; Drs. Celia Aguilar, Emilio Prado, and Misses Imgard Schmidt and Sulima Dujac, National Institute of Bacteriology; Drs. Arturo Scroggie and Augusto Schuster, Roberto del Rio Hospital; Dr. Hugo Enriquez, director, Drs. David Goldberg and Samuel Vaisman of the J. J. Aguirre Hospital; Dr. Enrique Pereda, and Mr. Jerjes Vildosola, department of biometrics, National Health Service; Drs. Victor Fernandez, Manuel Sanhueza, and Mr. Sandoval, National Health Service at Concepción; and Dr. John Pomeroy, Regional Hospital, Concepción.

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BREAST CANCER IN CONNECTICUT, 1935-1953

STUDY OF 8,396 PROVED CASES

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Various beliefs concerning the curability of mammary carcinoma were tested in a study of reports on 8,396 microscopically proved primary cancers of the female breast collected by a state registry over a period of 19 years. The period was broken down into two seven-year periods and one five-year period in order to discover trends in therapeutic results that might parallel changing policies in surgery, radiology, and diagnosis. Comparison of group 1 (first seven-year period, diagnosed in the years 1935 through 1941) with group 2 (1942 through 1948) revealed an increase from 46.3% to 51.0% in the number of patients surviving five years after diagnosis. This improvement of 4.7% was significant but its interpretation was not clear. There was a consistent failure of about 30% of the patients thought to have localized cancer to survive five years. The greatest improvement in survivals between groups 1 and 2 was in the type of patient that received radical surgery plus postoperative irradiation. There was also a significant difference favoring the survival of patients treated by radical surgery over those treated by limited surgery. Hence the authors would recommend the combination of radical surgery and postoperative irradiation for every patient who satisfies the criteria of suitability for treatment. In this series, the woman who had a cancer in one breast was five times as likely to develop one in the other breast as a woman who did not have one. The outlook for a younger woman in this study was no worse in terms of survival than for an older woman.

There is no cancer of humans that has received more attention from physicians and none concerning the proper treatment of which there is still more general disagreement than breast cancer. Because of the accessibility of the breast, surgical approaches to this cancer were made early in medical history. What might now be termed the classic operation for this condition was described and performed early in the era of modern surgery by Volkmann, Halsted, and Meyer. The great majority of breast cancers seem to be susceptible, at least in some degree, to the effects of radiation therapy. Increasing knowledge of the influence of hormones on the growth and development of breast cancer has opened the door to further palliative treatment for the disease in its advanced state, either by administration of the appropriate hormone or hormone-like substance, or by ablation of other functioning endocrine tissues from the body.

All of these advantages would seem to have pointed the way toward an increasing control of breast cancer, with a steady lessening of mortality figures. Add to this an undeniable improvement (in regard to the earlier time, in the course of the disease, when the patient first presents herself to the doctor) due chiefly to extensive and intensive public education concerning cancer in the United States, and you would expect a favorable result from treatment. The facts remain that there are no agreed-upon and fixed standards by which treatment for breast cancer can be measured today and that many scientists cannot decide whether the net effect of all treatment carried out during the past three decades has resulted in any real improvement in the five-year survival of victims of this disease.

Opinions with regard to the success of our average approach to the arrest or cure of breast cancer range from the most optimistic, that survival figures show a steady improvement, to the most pessimistic, that treatment, particularly radical mastectomy, has not affected the natural course of the disease at all.

There are widely held beliefs with regard to specific aspects of this problem that have not been thoroughly tested but have been used to support arguments in favor of this or that approach to therapy. Such beliefs are that breast cancer runs a more rapid and more malignant course in young women and in women who are passing through the menopause; that breast cancer occurring during pregnancy and lactation is inevitably fatal; that simple mastectomy is as effective as radical mastectomy in controlling this disease; and that the use of radiation therapy preoperatively or postoperatively adds nothing to the survival time.

The purpose of this study is to attempt to throw some light on some of these notions by analyzing the occurrence of breast cancer in the state of

Connecticut, and, very crudely, the results of treatment in an entirely unselected group of patients large enough that significant comparisons can be made between the figures in the appropriate subgroups. We hope that by resolving disputed points in the area of what is happening, the way may be cleared for the establishment of a unified approach to treatment based upon sound principles that have been demonstrated by experience.

Material for Study

From Jan. 1, 1935, through Dec. 31, 1953, reports of 8,396 microscopically proved primary cancers of the female breast were collected by the Connecticut Cancer Record Registry in the state department of health. The number of cases reported for three different periods during this time as well as the percentage of cases reported for which microscopic proof was found are shown in table 1. It can thus be seen that there has been not only an increase in the total number of cases reported annually during the past 19 years, as would be expected with an increasing population of an increasing average age, but also an increase in the percentage of proved cases.

TABLE 1.—*Total Number of Cases of Breast Cancer with Microscopic Proof of Diagnosis for Each of Three Year-Groups*

Group	Total Cases	Proved	
		No.	%
1 (1935-1941)	2,484	2,185	88
2 (1942-1948)	3,434	3,169	92
3 (1949-1953)	3,203	3,042	95

Five-year follow-up information is available only for those patients who were given diagnoses and treated through the end of 1948. For purposes of comparison with regard to five-year survival, the cases have been divided into the two seven-year groups indicated in table 1: those patients whose diagnoses were made from 1935 through 1941 and those whose diagnoses were made from 1942 through 1948. For comparisons with regard to incidence and type of treatment offered, a third five-year group was created, composed of patients whose diagnosis was made from 1949 through 1953. These groups will hereinafter be designated as groups 1, 2, and 3.

For comparisons regarding survival, the patients have been further classified as recommended by the American Cancer Society into "indeterminate" and "determinate" groups. Table 2 shows the breakdown of the proved cases from 1935 through 1948 by group according to this classification. It will be noted that the percentage of indeterminate cases has risen from 6% in group 1 to 11% in group 2. This is due principally to an increase in patients lost to follow-up of from 2 to 5%. The numbers of patients refusing treatment who died free of cancer within five years are not significant. Table 3 shows survival by year of treatment. All survival percentages were calculated on the basis of using all cases in the determinate group.

These cases were reported to the Connecticut Cancer Record Register almost exclusively from the 30 of the 37 general hospitals in Connecticut, which represent about 94% of the acceptable general hospital beds in the state, and from those hospitals outside the state that report cancers diagnosed in Connecticut residents. The first notice came from death certificates in about 25% of all cases of cancer reported to the state. The method of reporting the cases otherwise is already familiar and has been described in detail in other publications by one of us (M. H. G.) and others [1A] from the division of cancer of the Connecticut State Department of Health.

TABLE 2.—*Determinate and Indeterminate Cases in Group 1 (1935-1941) and Group 2 (1942-1948)*

	Group 1		Group 2	
Indeterminate				
Refused treatment	2		2	
Dead free of cancer	94		172	
Lost free of cancer	42		168	
Total		138		342
Determinate				
Dead with cancer	1,071		1,350	
Dead cancer status unknown	20		13	
Lost with cancer	9		21	
Living with recurrence	104		171	
Living with continuation	23		26	
Living free from cancer	820		1,246	
Total		2,047		2,827
Total cases		2,185		3,169

TABLE 3.—*Percentage of Survivals by Year of Diagnosis*

Yr. of Diagnosis	Total Cases, No.	Determinate Cases, No.	Living at 5 Yr.	
			No.	%
1935	207	188	77	41.0
1936	288	267	134	50.2
1937	291	275	105	38.2
1938	323	301	144	47.8
1939	328	310	145	46.8
1940	339	322	154	47.8
1941	409	384	188	49.0
1942	374	345	189	54.8
1943	416	388	204	52.6
1944	421	378	184	48.7
1945	462	417	224	53.7
1946	460	402	209	52.0
1947	499	438	212	48.4
1948	537	459	221	48.1
1935-1941	2,185	2,047	947	46.3
1942-1948	3,169	2,827	1,443	51.0

It must be emphasized that the classifications of stage of disease were made by a wide variety of persons and methods and those of grade by a number of pathologists of varying backgrounds and ideas on this subject. As far as whether radical surgery was performed, the principal criterion used in preparing the original cancer record is the designation applied to the procedure by the surgeon himself. There is no uniformity of opinion among surgeons today regarding what constitutes radical surgery for breast cancer. Certainly there is an even greater variation in practice with regard to the extent of the operation and the amount of tissue removed, even when there is agreement with regard to the principles involved. It can be stated broadly that, during the period covered by this study, as far as the general opinion and practice of surgeons in Connecticut is concerned, radical surgery can be taken to mean removal of the entire breast, a variable amount of fat and lymphatic tissue from the axilla, the pectoralis major (usually with its clavicular head), and the pectoralis inor (almost always).

TABLE 4.—*Division of Cases in Three Groups by Percentage According to Grade, Stage, and Age of Breast Cancer at Time of Diagnosis*

	Group 1 (1935-1941)	Group 2 (1942-1948)	Group 3 (1949-1953)
Total No.	2,185	3,169	3,042
Grade, %*			
1	6.2	7.7	4.4
2	35.6	39.2	33.1
3	16.0	18.6	17.5
Not Graded	42.2	34.6	45.0
Stage, %			
Localized	40.0	45.6	46.1
Regional metastasis	48.1	46.3	45.6
Remote metastasis	7.1	4.8	4.8
Unknown	4.7	3.3	3.4
Age, %†			
<45	24.2	20.3	22.2
45-54	24.9	25.6	23.4
55-64	26.3	25.4	23.8
65-74	18.6	19.6	19.1
75+	6.0	9.0	11.4

* In group 3, two cases were designated "in situ," making the total number 3,040.

† There were 55 cases in which the age was not stated: 16 in group 1, 18 in group 2, and 21 in group 3.

The observed differences between the number of lymph nodes (involved or uninvolved) found in the surgical specimens removed by different surgeons, even in one hospital, are enormous.[1] This might make for a considerable difference in classification of the cases by stage of disease, but it is not nearly so important for determining the absolute incidence of regional metastasis as is the question whether there is involvement of the internal mammary chain of nodes. During the period under consideration in Connecticut there were virtually no attempts made to perform biopsy on this chain systematically, let alone to extirpate it.

Limited surgery can be taken to mean anything from "radical" mastectomy down to local excision of the tumor in the breast. In the great majority of instances it means simple mastectomy. No attempt was made to differentiate partial from simple mastectomy, as the gradations between the two are gradual and since the ultimate results from treatment cannot be much different if only breast tissue is removed. With regard to the administration of radiation to the breast and the thorax generally either before or after surgery, there has been just as wide a variation of principle and practice as in the case of surgical treatment. This is further complicated by the selection of treatment necessarily dictated by the individual limitations imposed by the patient's physical status, attitude toward the treatment, and the type of surgery performed. Almost all of the treatment given has been by means of 220-kv. x-ray therapy machines.

Another factor that might be considered in evaluating the results of primary treatment, particularly in premenopausal patients, is the question of castration by irradiation or extirpation of the ovaries. It has been, generally speaking, the practice in Connecticut during this period to reserve this additional method of treatment for those patients with demonstrated remote metastasis or with recurrence of their disease. We do not have adequate information from these records to report at all on this subject. Neither has any attempt been made to assess the nature and results of treatment for recurrence, although this must play some part in the five-year survival picture.

It may be of interest to note that during the period 1935-1953 only 96 cases of microscopically proved breast cancer were reported in males in Connecticut. The results of treatment and survival in these patients may provide the subject of another communication.

Factors Relating to Incidence

Comparisons between groups 1 (1935-1941), 2 (1942-1948), and 3 (1949-1953) with regard to stage of disease are shown in table 4. The difference of 5.6% between groups 1 and 2 in the number of patients with localized breast cancer is significant at the 1% level of confidence. The decrease of 2.3% in the number of patients with remote metastases between the same groups is significant at the same level. The net result is that the difference between the percentage of those with regional metastases in these groups is not significant at even the 5% level. The shift is from remote to regional and regional to localized disease. There is no significant

TABLE 5.—*Total Cases in Groups 1 (1935-1941), 2 (1942-1948), and 3 (1949-1953) of Known Age Showing Stage of Disease at Time of Diagnosis According to Age Groups*

	Age Group, Yr.				
	<45	45-54	55-64	65-74	75+
No. of cases	1,837	2,054	2,091	1,600	759
Stage, %					
Localized	46.5	40.6	42.2	46.3	51.0
Regional metastasis	45.3	50.6	48.5	45.1	36.4
Remote metastasis	4.4	5.0	6.1	5.8	6.7
Unknown	3.8	3.8	3.2	2.8	5.9
Total	100	100	100	100	100

change in the percentage of cases in which the stage could not be determined from the record. The figures for group 3 are virtually identical with those for group 2.

The division of cases in the three groups according to grade of the cancer is shown in table 4. The grade was stated in 5,008 of the 8,396 cases, or 59.6%. Two cases in group 3 were described as carcinoma in situ. In a comparison of the grading of cases between the groups, it can be seen that, whereas there was a significant decrease in the number of ungraded cases in group 2, the percentage rose in group 3 to one that is higher (although not significantly so) than in group 1. There are no other significant differences.

The three groups were further subdivided into five age categories (table 4). This showed a remarkably even distribution of cases among all the age groups with a tendency to a general but slight decrease in the percentage for the younger age groups through the three periods, and a significant increase (5.4%) in the over-75 age category. The cases in which the age was not stated were almost equally divided among the three groups.

Consideration of the total number of cases in which the patients' ages are known, divided into stages of disease according to age categories, shows that in the group of those under 45 years of age approximately the same numbers of patients have disease that is localized as have regional metastases at the time of diagnosis (table 5). In the next age group the percentage of those with localized disease decreases significantly and then rises slowly in successive 10-year groups until it reaches 51%. The percentage of those with regional metastases at the same time decreases at about the same rate. The largest percentage of those with stage unknown (5.9%) is found, as might be expected, in the age group 75 years and over.

TABLE 6.—*Total Proved Cases Divided by Groups and According to Type of Treatment by Percentages*

Treatment	Group 1 (1935-1941), %	Group 2 (1942-1948), %	Group 3 (1949-1953), %	Net % Difference
Limited surgery	19.5	16.8	13.3	− 6.2
Radical surgery	43.1	56.7	65.4	+22.3
Radiation only	4.1	1.8	1.0	− 3.1
Limited surgery and radiation	6.1	3.9	3.1	− 3.0
Radical surgery and radiation	24.6	17.9	12.9	−11.7
Radical surgery and postoperative radiation...	22.6	17.4	12.5	−10.1
All forms	98.1	98.5	98.2	+ 0.1

A comparison of the percentages of cases subjected to various forms of primary treatment (table 6) shows that there has been no significant difference in the percentage of patients subjected to treatment (0.1%). There have been significant differences, however, in the type of primary treatment offered. In the succeeding periods of years there have been significant decreases in the relative numbers of patients treated by limited surgery (only two-thirds as many in group 3), by radiation alone (one-fourth as many), and by both limited and radical surgery in combination with radiation (one-half as many). The preoperative use of irradiation has not been popular in Connecticut from the very beginning of the study in 1935. Only 66 cases were treated in this way altogether, and only 11 from 1949 to 1953. There has been a remarkable increase in the number treated by radical surgery alone (one-half again as many). When the figures for radical surgery alone are combined with those for radical surgery plus irradiation, it can be seen that 78.3% of all diagnosed cases fall within this category for group 3 as against 74.6% for group 2 and 67.7% for group 1.

TABLE 7.—*Determinate Cases Divided According to Stage of Disease Showing Five-Year Survival Percentage in Groups 1 (1935-1941) and 2 (1942-1948)*

	Cases, No.		5-Yr. Survivals, %		Difference, %
All Determinate Cases	Group 1	Group 2	Group 1	Group 2	
Localized	793	1,229	70.1	71.2	+ 1.1
Regional metastasis	1,001	1,347	34.0	38.8	+ 4.8
Remote metastasis	155	151	0.6	4.6	+ 4.0
Not stated	98	100	51.0	38.0	−13.0
Total all cases..........	2,047	2,827	46.3	51.0	+ 4.7

Factors Relating to Survival

There has been a significant (at the 1% level) increase in the five-year survival from group 1 to group 2 of 4.7% (table 7). This improvement has been due to the improved survival of patients found to have evidence of regional metastasis, which was 4.8% (significant at the 5% level), since there has been no significant improvement in survival of those thought to have localized disease. Although the percentage of survival of patients with remote metastasis at the time of diagnosis has increased from 0.6% to 4.6%, the number of cases involved is not sufficient to judge the significance of this difference.

When the total number of cases in groups 1 and 2 were tested for survival according to grade (table 8), it was found that 82.2% of the patients with grade 1, 50.9% with grade 2, 38.5% with grade 3, and 46.0% with grade of cancer unspecified survived five years. The difference between these survivals is significant at the 1% level. The differences in survival within each grade between groups 1 and 2 are not significant.

When survival is considered according to age categories (table 9), it can be seen that there was improvement in survival in all ages between groups 1 and 2 except in the category of 75+, where there was a decrease. The only improvement significant at the 1% level, however, was in the 45-54 category. This improvement was by a greater percentage than for any other age category, and the percentage of five-year survivals in group 2 was the highest of all.

When the cases in age category 45-54 are studied from the standpoint of whether cancer was localized or had involved regional lymph nodes, significant differences were not demonstrated, but there appeared to be about an equal increase in the survival percentage in both instances (table 10).

Table 8.—*Determinate Cases in Groups 1 (1935-1941) and 2 (1942-1948) Divided by Grade of Cancer Showing Percentage of Five-Year Survival*

Grade	Determinate Cases in Groups 1 and 2, No.	5-Yr. Survivals, %
1	342	82.2
2	1,842	50.9
3	873	38.5
Unspecified	1,817	46.0

When all treated determinate patients are analyzed for five-year survival according to the method of treatment (table 11), it can be noted that there is a significant difference between the survival of all patients treated by limited as compared to radical surgery alone in groups 1 and 2. This difference is 8.2% for all patients and 9.3% for those in group 2. These differences are significant at the 1% level. Within each category of surgery, however, there was no significant change from group 1 to group 2. Survivals following treatment with radiation alone were few and the number of cases insufficient to test for significance of change. Survivals following both limited surgery plus radiation therapy and radical surgery plus radiation therapy were somewhat less than for those patients treated, respectively, by limited and radical surgery alone. There was no significant difference between groups 1 and 2 among those patients treated by limited surgery plus irradiation. There was, however, a difference significant at the 1% level between groups 1 and 2 among those patients treated by radical surgery plus postoperative radiation therapy.

In table 11, all patients in the determinate group treated by limited surgery with and without radiation are grouped together, and the same is done for radical surgery. The survival percentages are then calculated for groups 1 and 2. It is noted that, whereas there is no improvement from group 1 to 2 with limited surgery, there is a significant improvement in the patients treated by radical surgery. The difference between all patients in groups 1 and 2 treated by limited as against radical surgery in survival is 6.1%, and in group 2 it is 8.3%.

Further analysis of the category of patients treated by radical surgery plus postoperative irradiation, including those patients who also had preoperative irradiation (table 12), shows that an improvement in survival significant at the 5% level occurred in those patients with regional metastasis at the time of surgery. Again, large but, because of the small number of cases, not significant, percentages of improvement were noted in patients under the age of 45 and aged 45 to 54 (table 13). A comparison of the percentages of patients in these two age groups apparently free of their disease after five years with those merely surviving (table 14) shows differences of 4 to 6%. Among the category of patients treated by radical surgery plus postoperative radiation therapy (including those also treated by preoperative radiation therapy), the improvement in the percentage of those who were surviving apparently free of cancer parallels that of the total five-year survival percentage.

It is additionally noted (table 15) that in group 1, 46% of those receiving limited surgery were aged 65 or over. Patients of this age made up 24.6% of the whole group. In group 2, where patients of this age made up 28.6% of the total group, 53% of those being treated by limited surgery fell within these limits. In group 1, among patients with disease apparently localized to the breast, only twice as many patients received radical as received limited surgery, whereas in group 2, two and one-half times as many received radical surgery (table 16). Only four times as many patients in group 1 with regional metastases received radical surgery as received limited, but more than six times as many did in group 2.

A factor that relates to the incidence of breast cancer as well as to survival is the discovery that in the Connecticut experience the woman who has had a cancer in one breast is five times as likely to develop one in the other breast as a woman who has not had one. She is also one and one-half times as likely as the average woman to have a cancer of one of the other genital organs at some time during her life. This "5:1" ratio was determined by a study of a population of 8,396 with breast cancer in Connecticut from 1935 to 1951. The expected numbers of cases of second primary cancer in the second breast and the genitals were computed from the age-specific cancer incidence rates for female breast and genital organs in Connecticut for the same years. Comparison of observed and expected numbers yielded the following results: In the other breast, the expected number was 51, the observed number 272, and the ratio of observed to expected

Table 9.—*Percentage of Five-Year Survivals Among Determinate Cases in Groups 1 (1935-1941) and 2 (1942-1948)*

Age, Category, Yr.	Determinate Cases, Total		5-Yr. Survivals, %		Difference, %
	Group 1	Group 2	Group 1	Group 2	
<45	506	599	49.2	52.9	3.7
45-54	521	731	45.1	54.4	9.3
55-64	534	734	44.8	51.0	6.2
65-74	360	523	45.0	48.2	3.2
75+	113	225	46.0	40.4	−5.6

was 5.83:1. In the genital organs, the expected number was 46.1, the observed number 74, and the ratio of observed to expected was 1.61:1.

Comment

Factors Affecting Incidence.—There is a significant difference between the number of patients with breast cancer in a localized state (as measured by rather crude standards) presenting themselves for treatment for the first time in the first and second seven-year periods of this study. The trend for the third period of only five years seems to be following that for the second. There is correspondingly a significant decrease in those who have evidence of remote metastases when first seen, again as measured for the most part by only clinical or x-ray evidence. There was essentially no change in the percentage of those cases where the stage could not be determined from the record.

It would therefore appear to be true, as measured by the inexact clinical methods used to determine the stage of the disease in this group of cases, that more women with breast cancer in Connecticut are presenting themselves in an earlier stage of their disease than was the case in 1935. Against this we must balance such evidence as that presented by Saphir[2] and Pickren,[3] who recut lymph nodes classified as noncancerous after radical mastectomy and found, on serial section, that between 18 and 33% of such nodes were involved with cancer. Also, it is Haagensen's[4] belief, based on long and careful observation, that 70% of the patients admitted to the Presbyterian Hospital with breast cancer during recent years already had axillary metastasis.

Review of the figures related to the grading of microscopically proved breast cancer indicates that the practice of grading these tumors has never been universal in Connecticut, only three-fifths of the total having been so designated. Although there appears to have been increased interest in this subject during the second period (1942-1948), there now seems to be less than ever before. In the absence of a consistent set of standards for grading, it is futile to discuss the significance of the exact distribution of cases by grade.

Table 10.—*Five-Year Survivals for Groups 1 (1935-1941) and 2 (1942-1948) Among Patients Aged 45-54 with Determinate Cases by Stage of Disease*

	Determinate Cases, Total		5-Yr. Survivals, %		Difference, %
Age Category 45-54 Yr.	Group 1	Group 2	Group 1	Group 2	
Localized to breast	174	299	69.0	74.6	5.6
Regional metastasis	282	368	36.9	43.8	6.9
Remote metastasis	43	35	0	5.7	5.7
Stage unknown	22	29	50.0	41.4	—8.6

When the total of proved cases was divided into five age categories for each of the three periods of observation, it could be seen that there has been an apparently small decrease in the percentage of cases in the age groups below 65. The percentage of patients over the age of 75 has just about doubled, which is extremely significant, because when the number of patients of known age is considered in terms of stage at the time of diagnosis, it is seen that this older group appears more likely to be found with localized disease. This indicates that a major effort toward early detection should be directed at that age group. Comparison with Haagensen's[5] figures for age distribution of 1,544 breast cancer patients entering the Presbyterian Hospital from 1915 to 1942 (although exactly the same year groups are not used) would tend to confirm this trend.

Table 11.—*Determinate Cases in Groups 1 (1935-1941) and 2 (1942-1948) Divided According to Type of Treatment to Show Percentage of Five-Year Survivals and Differences in Percentage*

	Determinate Cases, Total		5-Yr. Survivals, %		Difference, %
Types of Treatment	Group 1	Group 2	Group 1	Group 2	
Limited surgery	378	451	48.9	47.9	—1.0
Radical surgery	884	1,594	55.4	57.2	+1.8
Radiation therapy only	87	57	8.0	3.5	—4.5
Limited surgery and radiation	129	110	41.1	40.9	—0.2
Radical surgery and radiation	515	529	40.2	47.8	+7.6
Radical surgery and postoperative radiation	473	511	40.2	48.9	+8.7
Total limited surgery with or without radiation	507	561	46.9	46.5	—0.4
Total radical surgery with or without radiation	1,399	2,123	49.8	54.8	+5.0

Factors Affecting Treatment.—It is encouraging to note that, in spite of the pessimistic views that the public at large and many members of the profession hold regarding the curability of cancer, only about 1.5% of all those patients with microscopic proof of the disease do not receive any treatment. We know that, of the 141 patients in this category between 1935 and 1953, 15 refused treatment and 20 were considered beyond hope of treatment. The reasons are not stated in the case of the other 106 patients. Three patients who refused treatment were reported still living at the end of five years.

With regard to the type of treatment offered, there has been a steady and significant decrease in the use of limited surgery, either alone or accompanied by radiation therapy. During the most recent period of observation (1949-1953) only 1 out of 100 patients was treated by radiation alone. On the other hand, the use of radiation after radical surgery appears to have declined very dramatically, while the number of patients subjected to radical surgery as the primary form of treatment has increased significantly. The use of preoperative irradiation before radical mastectomy was never popular and by 1953 had virtually ceased in Connecticut. This experience is apparently general throughout the United States, where increasing emphasis has been placed on radical surgery alone as definitive treatment for localized breast cancer.

The steady and significant increase over the three periods studied in the numbers of patients treated by radical surgery with or without irradiation indicates either that a higher percentage of patients is being seen in an earlier stage of the disease or that the indications for such surgery have been broadened. Since we already have some evidence to indicate the former (a decrease in the number of patients seen for the first time with remote metastasis), we cannot assume the latter. Undoubtedly, the availability of better methods of supportive therapy and the advent of more surgical specialists into the state has had some effect on these figures.

Table 12.—*Determinate Cases of Groups 1 (1935-1941) and 2 (1942-1948) Divided According to Stage of Disease Showing for Those Patients Treated by Radical Surgery Plus Irradiation (Including Preoperative) Percentage of Five-Year Survivals and Difference in Percentage*

	Determinate Cases, Total		5-Yr. Survivals, %		Difference, %
Stage of Disease	Group 1	Group 2	Group 1	Group 2	
Localized	123	147	62.6	69.4	+6.8
Regional metastasis	323	342	34.1	42.7	+8.6
Remote metastasis	23	11	0	7.1	+7.1
Stage unknown	23	15	43.5	13.3	−30.2

Factors Affecting Survival.—The significant improvement in five-year survival for all patients in group 2 over group 1, although small (4.7%), is encouraging—that is, until it becomes apparent that this improvement seems largely to have occurred among those patients found at the time of first treatment to have regional metastasis. The fact that there is a similar improvement (4%) in the number of those apparently free of cancer after five years, although it is almost entirely a clinical observation and offers no guarantee that the same patients will not reveal metastasis five years later, may be interpreted to indicate that the increasing employment of radical surgery with the removal of involved axillary nodes is the cause of this improvement.

Table 13.—*Determinate Cases of Groups 1 (1935-1941) and 2 (1942-1948) Divided According to Age Categories Showing for Those Patients Treated by Radical Surgery Plus Irradiation (Including Preoperative) Percentage of Five-Year Survivals and Difference in Percentage*

	Determinate Cases, Total		5-Yr. Survivals, %		Difference, %
Age Category, Yr.	Group 1	Group 2	Group 1	Group 2	
<45	175	155	39.4	49.7	+10.3
45-54	147	159	41.5	51.6	+10.1
55-64	108	133	37.0	42.9	+ 5.9
65-74	56	60	41.1	45.0	+ 3.9
75+	5	8	60.0	50.0	−10.0

The consistent failure of about 30% of patients thought to have localized cancer to survive five years indicates that the original impression was in error and that cancer existed in distant or else in undisturbed lymph nodes, was not recognized on removal, or had been transmitted to other organs directly by the blood stream. Although the reports of Handley and Thackray [6] and many others since seemed at first to indicate that much, if not all, of this apparent discrepancy was due to involvement of internal mammary nodes alone, Haagensen [7] disagrees. After a careful review of the experience of others, including those at the Presbyterian and Francis Delafield hospitals, he suggests that, before metastasis to the axillary nodes occurs, internal mammary node involvement is so infrequent that it has little therapeutic significance. Further, Monroe [1] was able to demonstrate in a small series that, where 30 or more lymph nodes were found in the radical mastectomy specimen and all were free of cancer, 100% of the patients survived five years, as contrasted with a 50 to 67% five-year survival in a series where the staging had to be based on findings in less than 30 lymph nodes.

Table 14.—*Determinate Cases in Groups 1 (1935-1941) and 2 (1942-1948) Treated by Radical Surgery and Irradiation (Including Preoperative) in Age Categories Under 45 and 45-54 Showing Comparison Between Survivals and Survivals Apparently Free from Cancer*

	Determinate Cases Total		Free of Cancer in 5 Yr., %		Surviving 5 Yr., %	
Age Category, Yr.	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
<45	191	165	35.5	43.2	39.2	49.7
45-54	155	172	35.3	46.0	42.0	50.0

That the degree of improvement in survival is not greater may then be considered to be due to the fact either that too many patients are still being selected for radical surgery who cannot be expected to be cured because of the extent of their disease or that the procedure of "radical mastectomy" as it is generally carried out is not radical enough in its extent to effect cure. The question of the effect on survival of "extended radical mastectomy" is now being tested at several clinics in this country and abroad. Although there can be no question that a more stringent application of criteria such as those established by Haagensen [8] in the selection of patients for radical mastectomy would improve the percentage of survival in that group, the effect on the survival time of the whole group of patients for any particular hospital that would strictly enforce this regulation on its total breast cancer population is yet to be determined.

Grading and Survival: The validity of the grading of breast cancer as a guide to prognosis seems to have been demonstrated by the significant differences in survival for patients with grades 1 to 3. Because of the small numbers of cases involved, no attempt has been made to interrelate grade and stage with survival. Since this ability to prognosticate to a certain extent in spite of lack of clear-cut agreement as to the correct criteria for grading breast cancer is demonstrated, the decrease in interest in Connecticut in recording this observation is to be deplored.

Age and Survival: With regard to the association between the age at which breast cancer is discovered and survival, Lewison[9] was able to conclude, after reviewing the literature, that the evidence appeared to be conflicting. The reports based on rather large series of cases, however, such as those by Richards,[10] Hawkins,[11] Lane-Claypon,[12] and Harrington,[13] tend to confirm the experience of this series. In brief, it indicates that younger women do not necessarily have a poorer prognosis than older women, whether the disease is localized or there are regional metastases. When there is regional metastasis, the average woman who is under 45 at the onset survives more years than the average woman in the 65-74 age group.

TABLE 15.—*Total Cases in Groups 1 (1935-1941) and 2 (1942-1948) Showing Type of Treatment According to Age Categories*

	Age, Yr.													
	<45		45-54		55-64		65-74		75+		Not Specified		Totals	
Type of Treatment	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Limited surgery	66	67	63	80	99	102	123	144	73	138	3	2	427	533
Limited surgery and radiation	28	19	26	33	43	23	23	29	9	17	4	2	133	123
Total limited surgery	94	86	89	113	142	125	146	173	82	155	7	4	560	656
Radical surgery	216	366	256	491	273	493	164	346	25	93	7	9	941	1,798
Radical surgery and radiation	191	165	155	172	120	153	63	65	7	10	2	3	538	568
Total radical surgery	407	531	411	663	393	646	227	411	32	103	9	12	1,479	2,366

The figures obtained in this study show that the outlook for the younger woman with breast cancer is no worse than that for the older woman, whether her disease is localized or involves regional lymph nodes. If anything, women under the age of 55 have a higher five-year survival percentage than those over that age. Because of exclusion from the determinate group of patients dying free of cancer within five years, no allowance need be made in this study for adjusting data for normal life expectancy.

Among the patients in group 2, the outlook for women whose disease was first discovered during the period of the onset of menopause (45-54) was better than that for any other of the four age groupings. This is in agreement with the experience of Smithers and associates.[14] This category of patients also demonstrated the only percentage of improvement between groups 1 and 2 that was significant at the 1% level (9.3%). A breakdown of those patients with localized disease and those with regional metastasis shows that the improvement in survivals was shared equally between the two categories.

The mean duration of life in a series of 777 patients with untreated breast cancer was 38.5 months, although there were variations from 3 months to 35 years, according to Wade.[15] The natural duration of life was similar in all age groups. It is, therefore, significant to find that 57.2% of patients in group 2 subjected to radical mastectomy are surviving five years after treatment. It is time to stop talking about the failure of treatment to influence the natural course of breast cancer.

The significance of the observed difference of 9.3% in survival between patients in group 2 treated by limited surgery and those treated by radical surgery is difficult to evaluate when the basis for selection for limited surgery is not known. The fact that survivals following both types of surgery plus irradiation were less than for the surgical treatment alone in this group indicates that chiefly those patients who appeared to have a poorer outlook were treated with irradiation.

The one group of treated patients who showed a significant improvement in survival rate (8.7%) were those who received radiation after radical surgery. The improvement in patients with regional metastasis was significant at the 5% level and was greatest in those patients aged 54 and under. Comparison of the number of those patients so treated who were apparently free of their disease in five years with the number of those who were surviving indicates an improvement of 6 to 8%, showing that all of this improvement may be due not simply to increased survival time but rather to the actual control of the disease.

This experience suggests that more attention be devoted to the desirability of administering postoperative radiation to patients who have had radical mastectomy, regardless of how favorable the prognosis may appear to be. Although the total number of cases is not large enough to produce truly significant results, with radical surgery alone in localized disease there was only 1.9% improvement in survival between groups 1 and 2, and in those with regional metastasis only 2.5%. With radical surgery plus postoperative radiation there was improvement in survival for localized disease of 6.8% and for regional metastasis of 8.6%. Thus, it has happened that in group 2 cases, the five-year survival for patients with regional metastasis treated by radical surgery alone was 41.1%, and for those treated by radical surgery plus postoperative radiation, by every other indication in this study a category of patients with a more unfavorable prognosis, 42.7%.

Summary and Conclusions

In spite of the advances that have been made in understanding the natural history of breast cancer, earlier recognition by patients of the disease in themselves, and improvements in methods of treatment, there has been disagreement as to whether there has been any real improvement in survival from this disease. An analysis of the incidence of, treatment for, and percentage of five-year survival from breast cancer in Connecticut as exemplified in the records of 8,396 microscopically proved primary cases has been made to help resolve some disputed points in this field. These case records were collected by the Connecticut Cancer Registry in the state department of health from 1935 through 1953 from 30 general hospitals in this state. For purposes of comparison the cases were divided into two seven-year groups and one five-year group, referred to throughout as groups 1 (1935-1941), 2 (1942-1948), and 3 (1949-1953). The percentage of reported breast cancer cases that are confirmed by microscopic examination of a slide made from the cancer has increased to 95%.

TABLE 16.—*Total Cases in Groups 1 (1935-1941) and 2 (1942-1948) Showing Type of Treatment According to Stage of Disease*

Type of Treatment	Localized		Regional Metastasis		Remote Metastasis		Not Specified		Totals	
	1	2	1	2	1	2	1	2	1	2
Limited surgery	231	333	150	151	29	32	17	17	427	533
Limited surgery and radiation	51	69	55	38	15	9	12	7	133	123
Total limited surgery	282	402	205	189	44	41	29	21	560	656
Radical surgery	439	956	442	858	24	37	36	47	941	1,798
Radical surgery and radiation	138	162	352	376	23	15	25	15	538	568
Total radical surgery	577	1,018	794	1,234	47	52	61	62	1,479	2,366

Five-year follow-up information is available for groups 1 and 2. Figures describing incidence and forms of treatment are also drawn from group 3. All figures relating to survival were calculated from the determinate group, which made up 94% of group 1 and 89% of group 2 patients. The statement of the surgeon was accepted with regard to "radical" mastectomy. All other surgical procedures except biopsy were classified as "limited" surgery. There was no uniformity in the selection of patients for surgery with or without radiation therapy, in the choice of the type of surgery, or in the procedures performed in either surgery or radiotherapy. No attempt was made to enumerate other types of therapy, such as hormonal, either supplemental or ablative, or to evaluate its results or the treatment of recurrence in any way. The criteria used to decide whether disease was localized to the breast, principally whether metastasis was found in axillary lymph nodes removed at surgery, are recognized to be extremely crude.

There was a significant increase of 5.6% in the number of cases where cancer was thought to be localized from groups 1 to 2 but no further increase in group 3. The grade of the cancer was described in only 59.6% of the 8,396 cases. Six and one-tenth per cent were classified as grade 1, 36.0% grade 2, and 17.5% grade 3, or roughly 10, 60, and 30% of the total number graded, which was 5,008. There has been no significant increase in the percentage of tumors being graded over the whole period of the study.

There is a remarkably even distribution of numbers of cases among the five age groups which were established for purposes of analysis (under 45, 45-54, 55-64, 65-74, and 75 and over). There has been a significant increase in the percentage falling in the oldest age group over the years. There have been significant decreases from group 1 to group 3 in the relative numbers of patients treated by limited surgery (two-thirds as many), by radiation alone (one-fourth as many), and by both limited and radical surgery in combination with radiation (one-half as many). Preoperative radiation has been insignificant. Sixty-seven and seven-tenths per cent of the patients in group 1, 74.6% in group 2, and 78.3% in group 3 were treated by radical surgery, either with or without the use of radiation therapy.

There has been a small but significant increase in the five-year survival from group 1 (46.3%) to group 2 (51.0%). This appears to be due largely to improved survival of patients with evidence of regional metastasis (34% to 38.8%). It appears that with increasing age there is a tendency for the cancer to be found in a localized state at the time of diagnosis. The occurrence of localized disease in all cases 45-54 is 40.6% against 51.0% for age 75 years and over. There are significant differences in survival among patients whose cancers were graded 1 (82.2%), 2 (50.9%), and 3 (38.5%). Those with grade unspecified had a five-year survival rate of 46%, which indicates that they probably represented a mixture of grades of cancer, rather than cancers that could not be graded because of extreme anaplasia. Patients who were in the age category 45-54 in group 2 showed the highest survival percentage of any age category in groups 1 and 2, and showed the only significant improvement in comparisons between groups 1 and 2 according to age. There was equal improvement in survival in this category between cases with localized disease and regional metastasis.

There is a significant difference in the five-year survival between patients treated by limited and by radical surgery in both groups 1 and 2, (9.3% in group 2 cases). Within each category of surgery there is no improvement from group 1 to group 2, however. Survivals for five years after treatment by radiation alone were very few. Survivals following both limited surgery plus irradiation and radical surgery plus irradiation were somewhat less than for those patients treated by limited and radical surgery alone. Although there was no difference in survivals between groups 1 and 2 among those patients treated by limited surgery plus irradiation, there was a significant difference among those treated by radical surgery plus irradiation (8.7%).

Suggestive improvements were noted in the survivals of patients found to have regional metastasis and of patients under the age of 45 and aged 45-54. A comparison of the percentages of patients apparently free of their disease after five years with those merely surviving shows differences of 6 to 8%. Among the category of patients treated by radical surgery plus postoperative irradiation, the improvement in the percentage of those who were surviving apparently free of cancer parallels that of the total five-year survival percentage. Although there is no apparent tendency between groups 1 and 2 to restrict limited surgery to patients aged 65 or over, there appears to be a slight tendency to use more radical surgery for disease apparently limited to the breast.

The outlook for the younger woman in this study was no worse in terms of survival than for the older woman, whether the disease was originally found to be localized or involving regional lymph nodes. If anything, women under the age of 55 seemed to have a higher five-year survival percentage than those over that age. The women whose cancer is diagnosed in the menopausal period (45-54) does not have a poorer chance of survival than those in other age categories studied. There does appear to be a tendency for regional or remote metastasis to occur more frequently in the 45-54 and 55-64 age groups than in others. A woman who has had a cancer in one breast is apparently five times as likely as one who has not had a breast cancer to develop one in the other breast, and one and one-half times as likely to develop cancer in one of the other genital organs at some time in her life. These differences are statistically significant.

More women in Connecticut seem to be presenting themselves for treatment in an earlier stage of their disease. However, a major effort at early detection of breast cancer should be made in those over the age of 75, in which age category the number of cases has about doubled. Only 1.5% of those with microscopic diagnosis of breast cancer are not receiving any treatment. Only three patients who refused treatment were still living at the end of five years.

The consistent failure of 30% of patients thought to have localized disease to survive five years only indicates the inaccuracy of our methods for determining this question. In group 2 cases, the five-year survival for patients with regional metastasis treated by radical surgery alone was 41.1%, and for those treated by radical surgery plus irradiation (those patients who by every other indication in this study must have been thought to have a more unfavorable outlook) it was 42.7%.

There is a significant difference favoring the survival of those patients treated by radical surgery over those treated by limited surgery in this study. Since the greatest improvement in survivals between group 1 and group 2 is in the group that received radical surgery plus postoperative irradiation, we conclude that every effort should be made to encourage the use of this combination of therapy for every patient who satisfies the criteria of suitability for treatment directed towards cure of breast cancer.

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EVALUATION OF SELECTED LEADS IN ELECTROCARDIOGRAPHIC SCREENING

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210 patients representing the average type of cardiac disturbance present in adults, with a predominance of arteriosclerotic and hypertensive heart disease, were studied with varying combinations of two, three, or more leads to determine the screening potentialities of such groupings. Single leads are not highly efficient in detection of abnormalities. Leads 1, aVF, and V_5 or aVR, 3, and V_5 selected approximately 95% of the patients with disease. Two or three leads as a screening procedure do not establish the merit of such a procedure and do not evaluate the problem of "false-positives" in apparently normal persons.

The application of multiphasic screening in surveys for important major diseases has led to utilization of single rapid procedures which can be carried out by a trained technician in the absence of a physician. Such procedures are most valuable in mass surveys and should detect a large percentage of cases of the disease or diseases concerned with minimal false-positive selections.[1] The electrocardiogram has been incorporated in some studies,[2] and considerable discussion has arisen on its merits for this purpose.

The taking of the standard 12-lead electrocardiogram is time-consuming and, in the older age groups in which coronary disease is frequent, frequently shows little or nothing distinctly abnormal. Various surveys [3] indicate that 35% or more of such patients may have 12-lead or 13-lead electrocardiograms within normal range. For example, Phillips and his associates [2b] found 12-lead electrocardiograms abnormal in 65% of a group of city workers with definite heart disease. Dawber and his group [4] found that 53.1% of those with definite heart disease had normal electrocardiograms and that these would be missed in electrocardiographic surveys. These data would seem to show that the time and effort going into complete electrocardiographic examinations as a screening procedure in mass surveys would be too great for the rewards obtained. Be that as it may, the electrocardiogram has been found to be the best single technique for cardiac case finding,[2b] and there are selected groups, such as those chosen by age, in which electrocardiographic evidence is the most important evidence of the existence of heart disease. This is true, for example, in the group of patients with arteriosclerosis. Two basic problems arise, therefore, if the electrocardiogram is used in screening. The first concerns that just discussed in reference to normal tracings in overt disease. Secondly, and independently, is the problem of whether, when such tracings are decided upon, a full 12-lead or 13-lead recording is necessary. It is with the latter problem that the present report is concerned.

To test the efficacy of selected leads in this respect we have chosen 307 12-lead electrocardiograms from 210 patients. All patients were classified as having abnormal tracings by standard criteria.[5] Data on the abnormalities present in each individual lead, as well as in combinations of two or more selected leads, were transferred to IBM cards so that they could be sorted according to th abnormalities found. Of the 210 patients, 200 wer males and 10 were females. The age distribution o the patients was as follows: 15-24, 7; 25-34, 5 35-44, 25; 45-54, 27; 55-64, 102; 65-74, 31; 75-84, 6 and 85-94, 1. There were six remaining patients i whom the age was not known. All were adults.

In the 307 12-lead tracings, abnormalities were found in single leads in descending order of fre quency as follows: V_5, 247; V_6, 242; aVR, 191; lead 1, 180; V_4, 177; lead 2, 159; V_2, 148; aVF, 143, V_3, 137; V_1, 122; lead 3, 97; and aVL, 62.

In lead V_5, the lead showing the greatest number of electrocardiographic abnormalities, only 80% of the tracings were classified as abnormal. In no single lead was the presence of abnormalities seen sufficiently high for that lead to be useful alone in selecting over four of every five patients. For this reason, combinations were tried in which overlapping of abnormalities was minimal and detection of numbers of abnormalities maximal. Of these combinations, those showing the highest degree of selection are given in the table. Here it will be seen that the combination of the three limb leads, lead V_2, and lead V_5 selected 300 of the 307 records. In addition, there were certain tracings which are selected essentially by any lead. These represent tracings in which permanent atrial fibrillation atrial flutter, other arrhythmias, and defective in-

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traventricular conduction can be detected in any lead. There were six such tracings in this group, making a total of 306 records selected, or 209 of the 210 patients. This represents over 99.5% of the patients. The sorting was done first by selection of the lead indicated at the top of each group. The remaining unselected cards were then processed for abnormalities in each successive lead. In this way, in the first combination shown in the table (leads 1, 2, 3, V_5, and V_2), a total of 180 abnormalities in lead 1 were selected first. In lead 2, 62 of the remaining 159 abnormalities were shown. This means that 97 of the abnormalities seen with lead 2 were accompanied by abnormalities found with lead 1. Finally, after determinations for leads 3, V_5, and V_2 were made, there were six records with irregularities and abnormalities not peculiar to any one lead. These are recorded as "other" in the table.

Abnormalities Found in Electrocardiographic Tracings by Lead and Combination of Leads

Combination 1		Combination 2		Combination 3		Combination 4		Combination 5	
Lead	Abnormalities Found, No.	Lead	Abnormalities Found, No.	Lead	Abnormalities Found, No.	Lead	Abnormalities Found, No	Lead	Abnormalities Found, No.
1	180	V_2	148	aVR	191	1	180	1	180
2	62	V_5	123	3	28	2	62	aVF	51
3	9	aVF	12	V_5	69	3	9	V_5	48
V_5	38	Other	18	Other	8	V_5	38	Other	12
V_2	11					Other	6		
Other	6								
Totals Records, No.	306		301		296		295		291
%	99.7		98.0		96.4		96 1		94.8
Patients, No.	209		204		203		203		199
%	99.5		97 1		96.7		96 7		94.8

When leads 1 and V_5 were separated out, 269 of 307 tracings were selected. The addition of lead aVF added 10 more abnormalities to make a total of 279, leaving 28 unselected. In the group labeled "other," 12 additional records increased the total to 291, representing 199 of 210 patients or 94.8%. Leads aVR, 3, and V_5 accounted for 288 abnormal tracings, and, when eight "other" records were added, the total reached 96.4% of the tracings and 96.7% of the patients. Separation of leads V_2, V_5, and aVF, with addition of 18 "other," gave a selection of 301 records of 204 patients, with percentages of 98.0 and 97.1 respectively. Other combinations in groups of three were tried but were not as efficient as those mentioned above.

Comment

Attempts to evaluate multiple leads as a screening device have met with little agreement as to the usefulness of selected combinations. Dawber and his group [4] reported that lead 1 alone was just as good as multiple leads in picking up signs of cardiovascular disease. Others [6] have indicated that lead 1 is highly effective in dividing the groups surveyed into "normal" and "abnormal." Phillips and his associates [2b] found that unipolar limb and chest leads added little to the results with conventional limb leads alone. In our study, the findings are at variance with these reports. If lead 1 alone is used, a number of abnormalities are missed. For this reason we have attempted to determine the usefulness of selected combinations of leads, and this study was carried out to determine, in 12-lead tracings which are known to be abnormal, which combinations of two or three leads would be most helpful. This does not mean that the leads selected would lead to a final conclusion in the interpretation of the tracings. It merely means that, if the two or three leads selected were used, an abnormal electrocardiogram would be established. Thus, in studies in which electrocardiographic screening is considered, two or three leads might be depended on to select abnormalities to the degree noted. It must be pointed out that great importance rests in the nature of the group from which these electrocardiograms were selected. The patients used in this study represented the average type of cardiac disturbance present in adults, with a predominance of arteriosclerotic (76) and hypertensive (92) heart disease and, to a lesser degree, of syphilitic (11) and rheumatic (15) disease, as well as a few other scattered types (16). Within these limits it can be seen that leads 1, aVF, and V_5 or aVR, 3, and V_5 selected approximately 95% of the patients with disease. A combination of leads V_2, V_5, and aVF appeared to be more successful, but inspection of the data shows that 18, rather than 12 patients, came under the category labeled "other." It will be seen that these combinations included chest leads requiring the subject to undress.

These data do not establish the merit of two or three leads as a screening procedure generally and do not evaluate the problem of "false-positives" in apparently normal persons. They do point out that, in patients with cardiac disease with known abnormal electrocardiograms, selection of leads may be carried out to detect a very high percentage of abnormalities. If this degree of selection seems desirable in a screening procedure, the use of these leads alone, selected in this way, may have merit.

One must keep in mind the difference between screening and diagnosis. These remarks are not to be construed in any way as inferring that reduction in the number of leads is satisfactory from the standpoint of definitive electrocardiographic diagnosis.

Summary

In 307 12-lead electrocardiograms, taken on 210 adult patients with cardiac disease classified as abnormal by standard criteria, varying combinations of two, three, or more leads have been studied to determine the screening potentialities of such

groupings. The data indicate that single leads were not highly efficient in detection of abnormalities. However, combinations of three leads could be set up to detect abnormalities in 90 to 95% of the instances shown by the 12-lead electrocardiogram. Such a study was undertaken to evaluate the merits of selected leads in patients with known abnormal 12-lead tracings and the efficacy of selected leads in screening the group studied.

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This study was aided by funds from the Smith, Kline and French Foundation.

Dr. F. H. Knox, Kennedy Veterans Administration Hospital, Memphis, Tenn., supplied some of the tracings analyzed.

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CLINICAL NOTES

CARBON DIOXIDE AS CONTRAST MEDIUM IN ROENTGENOGRAPHY

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Insufflation of gas into the retroperitoneal space to delineate the configuration of organs and structures therein may often be a diagnostic procedure of considerable value. The complication of gas embolism has prevented broader and more frequent application of this technique. In a recent survey by Ransom, Landes, and McLelland,[1] 58 fatal and 64 severe nonfatal cases of gas embolism were found among 9,201 retroperitoneal pneumographic studies. It appeared from this review that presacral insufflation of gas was safer than insufflation via the perirenal route. Oxygen and air appeared equally dangerous as contrast mediums.

It is interesting to note that, in the original description of perirenal gas insufflation, Carelli and Sordelli[2] report on carbon dioxide. Later this gas was discarded as a contrast medium, apparently because it disappeared from the retroperitoneal tissues so rapidly. Recently, carbon dioxide has been used as an intracardiac roentgen contrast medium without serious ill-effects.[3] Moore and Braselton[4] demonstrated that carbon dioxide could be injected into various "great vessels" in relatively large amounts without harm, while such a procedure employing air or oxygen resulted uniformly in death from gas embolism. Carbon dioxide is at least 20 times more soluble than air and oxygen in blood and is theoretically safer for use as a contrast medium in the various body spaces. After injection, the bubble of carbon dioxide is diluted with oxygen and nitrogen from the body tissu and a serious gas embolism may then occur. T chance of sufficient gas being collected in the va cular space to cause a fatality by this mechanis is still much less when carbon dioxide is used th when air or oxygen is used as a contrast mediu

We have performed retroperitoneal insufflati of carbon dioxide in four patients by the presacr route, with use of amounts between 900 and 1,5 cc. of the gas. Absorption was so rapid that clea delineation of the retroperitoneal structures an particularly of the adrenal could not be achieve Lapides[5] has successfully outlined the kidneys an adrenals with carbon dioxide by the presacr route with use of larger amounts of gas (usuall 1,200-1,600 ml.). Our unsuccessful experiences wit presacral carbon dioxide insufflation led us to return to the perirenal approach in subsequent examinations, and it is felt that the smaller volum of gas which is needed with the perirenal approac compensates for the supposed greater danger ove the presacral route. Recently, Landes and Ransom have recommended the insertion of two polyethylene catheters through needles inserted into the presacral space and the injection of 500 to 1,500 cc. of carbon dioxide through each catheter.

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Technique

From 250 to 300 ml. of carbon dioxide is injected into the perinephric space through a no. 18 spinal needle introduced just below the 12th rib and just lateral to the paravertebral muscles, with the patient in a sitting position. A slow arciform excursion of the needle hub with respiration identifies penetration of the perinephric fascia. The carbon dioxide nay be injected from a 50-cc. syringe which is ttached by way of a three-way stop-cock to a cylinder of 100% carbon dioxide. The flow from this ank is controlled by a needle valve, and the gas is vithdrawn from an anesthetic bag previously filled o capacity. The patient usually complains of some pigastric discomfort and/or pain in the shoulder vhen approximately 300 cc. has been injected. At his point the needle is removed and the patient laced in a supine position and the film exposed. nterior, posterior, and oblique views are obtained. imultaneous pyelogram by the retrograde or intraenous route may be accomplished without difficuly. The exposure should be made within 10 to 20 ninutes, since the gas is rapidly absorbed and insufficient amounts remain after a 20-30 minute inerval for good contrast.

Comment

Fifteen patients have been studied with this techique within the past few months. Three of these atients had adrenal tumors which were satisfactor- demonstrated by the surrounding carbon dioxide ig. 1 and 2). If the tumor is not seen after inction of one side, the opposite side is insufflated the same technique. Carbon dioxide has also en used for mediastinography with delineation the mediastinal contents and without ill effects.

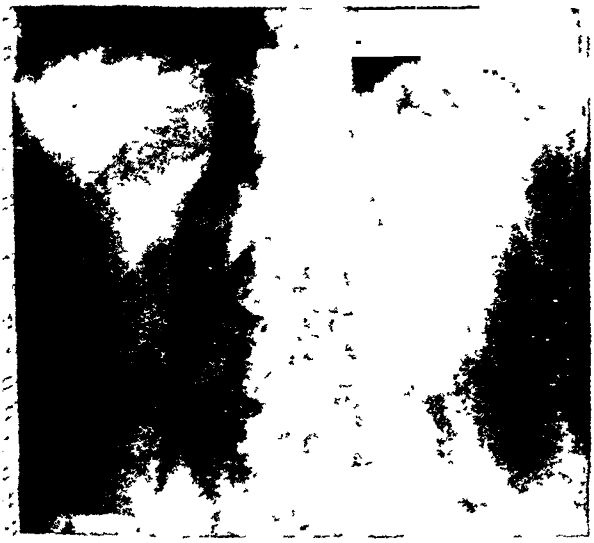

Fig. 1.—Roentgenogram showing pheochromocytoma of ht adrenal after perirenal insufflation of 300 cc. of carbon oxide as contrast medium.

Animal experiments[7] proved the rapid absorption of carbon dioxide as compared to oxygen and air. While the carbon dioxide, air, and oxygen appear equally good as contrast mediums, the carbon dioxide almost completely disappeared from the retroperitoneal space of dogs in 30 to 40 minutes, while the air was still clearly visible hours later when equal volumes of the gas had been injected into the perinephric space.

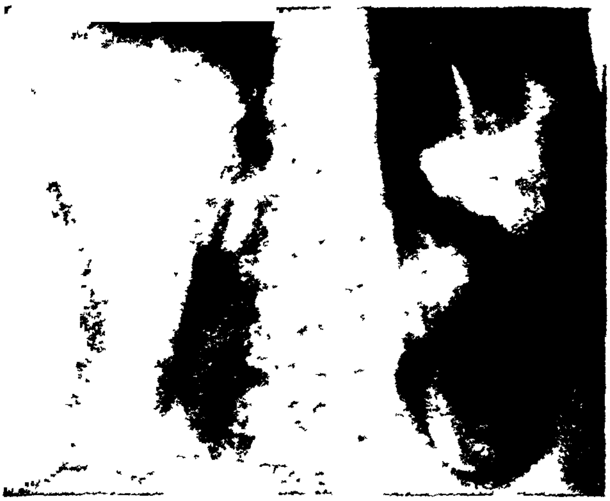

Fig 2—Roentgenogram taken 30 minutes after injection of 300 cc. of carbon dioxide into right perirenal area and 10 minutes after injection of 300 cc. of carbon dioxide into the left perirenal area.

A common finding of subcutaneous crepitus after insufflation of retroperitoneal air was not noted in any of the patients in whom carbon dioxide was injected.

Summary

The risk of fatal gas embolism after retroperitoneal pneumography often prevents its use as a diagnostic measure. Oxygen, nitrogen, or air injected by both the presacral and perirenal routes have been reported to produce fatal gas emboli.

Carbon dioxide is much more soluble in body fluids and appears to be a safer. adequate medium for such a study. The absorption of carbon dioxide is rapid but provides greater safety and better contrast of the renal and suprarenal area by injection into the perirenal space directly rather than by the presacral route. The exposure of the films should be made within 20 minutes after insufflation.

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TINEA NIGRA PALMARIS

A DISORDER EASILY CONFUSED WITH JUNCTION NEVUS OF THE PALM

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Tinea nigra palmaris is an uncommon skin disease caused by the fungus Cladosporium Wernecki. In the western hemisphere nearly all reported cases have involved the palms; however, cases involving other areas of the body, such as the neck or thorax, do occur.[1] The asymptomatic macular lesions, neither elevated nor scaly, are brown or black, appearing like an India ink[2] or silver nitrate stain.[3] The disease must be differentiated from nevi, contact dermatitis, pigmentation of Addison's disease, and drug eruptions. The pigmented lesions of photodermatitis due to bergamot or lime oil can be differentiated easily since they never occur on the palms.[4]

Only five cases of tinea nigra acquired in the United States have been reported, although cases acquired in Brazil,[5] Cuba,[2] Panama,[6] and Puerto Rico[7] in the western hemisphere are described in the literature. The first case to be reported from the United States was that of a 15-year-old girl from Tallahassee, Fla.[8] The other four cases were all seen within one year in Texas.[9] Recently, two other cases of tinea nigra acquired in Florida have been observed. Because both of these cases were mistaken clinically for junction nevi, attention is directed again to this disease.

Report of Cases

Case 1.—A 55-year-old woman who had not been out of Dade County (Miami), Fla., for 10 years was seen concerning an asymptomatic brown macular lesion on the left palm (fig. 1). For two and one-half months the lesion had gradually increased in size. The brownish discoloration was not elevated or scaly and measured approximately 2 by 2 cm. Microscopic examination of a scraping from the palmar lesion in 10% solution of potassium hydroxide reve branching hyphae (fig. 2). Cultures were identified a Wernecki by one of us (F. J. R.). The patient was trea with 3% salicylic acid in hydrophilic ointment, with c plete disappearance of the lesion, except for resu erythema, in three weeks.

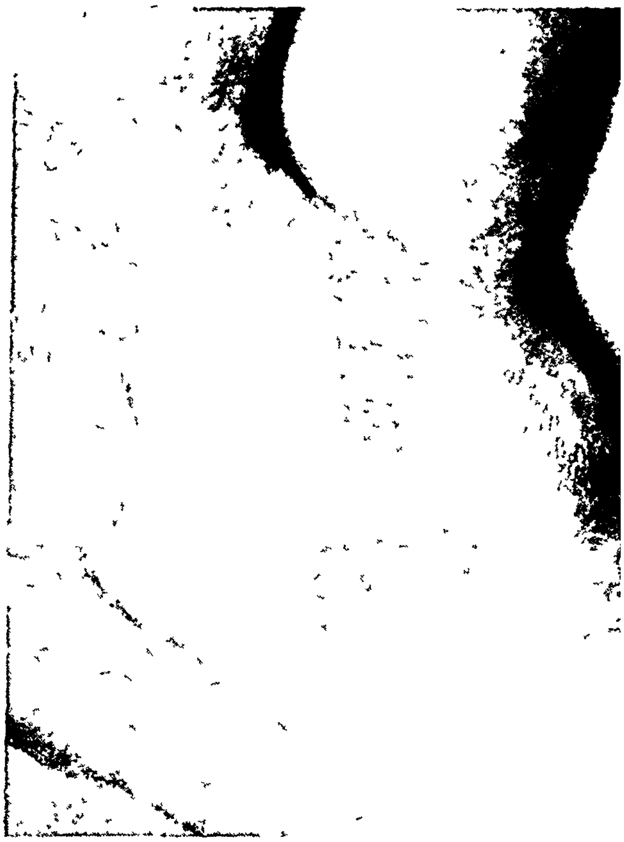

Fig. 1 (case 1).—Typical palmar lesion of tinea nigi palmaris.

Case 2.—A 5-year-old physician's daughter had been observed to have a small asymptomatic 8 by 10 mm p mented lesion on the right palm. The lesion looked like a café-au-lait pigmentation and was of normal texture No mycologic examination was made, and the lesion was e

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Dr Smith is a Public Health Service special research fellow cised, with a preoperative diagnosis of pigmented nevus. The site of excision healed uneventfully and grafting was not necessary.

Pathological Examination (fig. 3).—The specimen was stained with hematoxylin and eosin. The stratum corneum was hyperkeratotic, as would be expected in a section from the palm. There was no parakeratosis. In the outer two-thirds of the stratum corneum, predominantly in the upper one-third, were thick-walled septate brown hyphae, some of which were curved. The walls were prominent at the septa, giving an arthrospore-like appearance. At the ends of some of the hyphae were thick-walled spore forms. In some areas the spores were unattached to hyphae. The remainder of the epidermis was normal. There was a very minimal perivascular infiltrate of lymphocytes and histiocytes around the small blood vessels in the upper dermis. No other abnormalities were seen. Dr. Bernard F. Fetter considered the pathological picture to be diagnostic of tinea nigra.

The dematiacial (dark brown or black fungi) fungus, Cladosporium Wernecki, produces initially a moist, shiny colony. The young colony is glossy black and yeast-like in appearance. With age it becomes progressively more filamentous, to become invested eventually with a short nap of grayish mycelium in scattered areas. The rate of growth is slow, and maximal colony diameter is generally attained in two weeks. The yeast-like portions of the colony are produced by clusters of blastosporulating cells arising laterally from dark parent hyphae. In 8-to-12-day-old colonies, small groups or chains of conidia with one to three septa form on abbreviated lateral conidiophores. These conidia have a melanin-like pigment and resemble the sporulation of the saprophytic genus, Cladosporium (Hormodendrum). The yeast-like portion of the thallus simulates that observed in the genus Dematium.

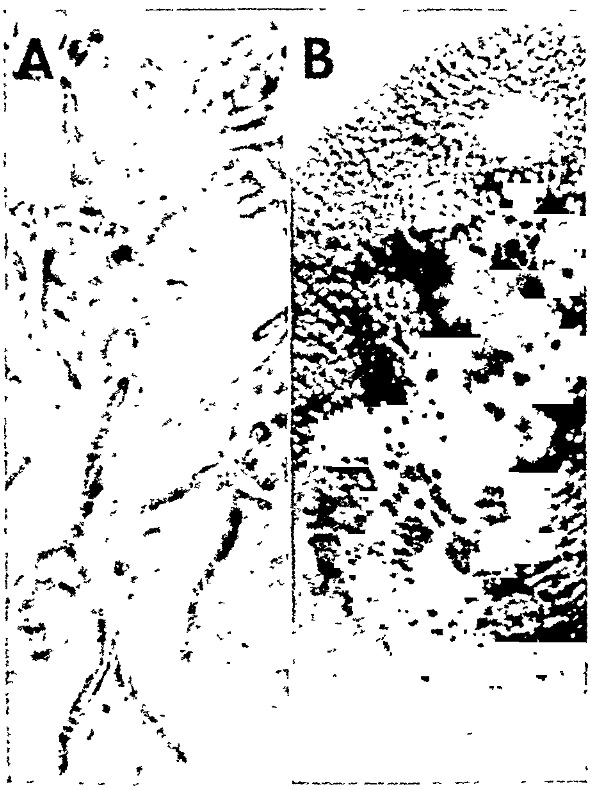

Fig. 2 (case 1).—A, scales from lesion on palm, showing multiple branching hyphae (× 800, 10% solution of potassium hydroxide). B, two-week-old culture of Cladosporium Wernecki (Sabouraud's agar).

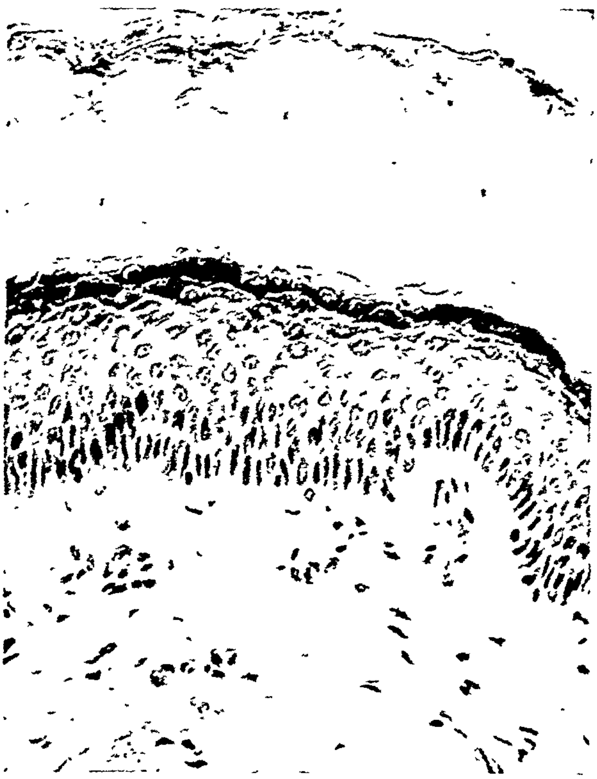

Fig. 3 (case 2).—Photomicrograph of tissue (× 270, hematoxylin and eosin). Note hyphae and spores in upper stratum corneum.

Because of conflicting reports in the literature concerning experimental transmission of the disease,[10] attempts to reproduce disease with inoculation of infected scrapings from a patient (case 1) and material from a culture of C. Wernecki on the soles, palms, and glabrous skin of two human volunteers were made. These were unsuccessful. No attempts to infect animals were made.

Comment

The observation of two more cases of tinea nigra occurring at widely separated parts of Florida suggests that the disease may be more common than generally appreciated. The disease is banal, asymptomatic, and responds readily to local therapy with keratolytic agents, such as salicylic acid and benzoic acid.[11] The importance of recognizing the condition is emphasized by the fact that both cases reported here were mistakenly diagnosed as nevi, in one instance by experienced plastic surgeons and in the other by competent dermatologists. This is also the first report in the United States of a case of tinea nigra in anyone over the age of 12 years.

Summary

With the two cases of tinea nigra palmeris acquired in Florida here reported, a total of three cases from Florida and four from Texas have now been reported from the United States. Attempts at experimental reproduction of the disease by inoculation of infected scales and the fungus itself into the epidermis of human volunteers were unsuccessful.

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Case 2 was reported with permission of Drs. Nicholas G. Georgiade and Bernard F. Fetter, Duke University School of Medicine, Durham, N. C.

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VARIANCE OF MEASUREMENT OF THYROID UPTAKE OF RADIOIODINE DUE TO COMPTON EFFECT

Egilda DeAmicis, S.B.
and
Russell F. Cowing, Boston

In a previous publication [1] the two methods employed at the New England Deaconess Hospital for the determination of radioiodine (I^{131}) uptake in the thyroid were compared and found by statistical analysis to give the same results. These two methods are (1) a single scintillation counter technique and (2) a setup with four Geiger-Mueller (bismuth cathode) tubes.[2] After a modification of the scintillation counter by the manufacturer, it was found that by comparison with the four-tube setup the uptake measurements were high by approximately 20 to 25%. These high scintillation counter readings seem to indicate that scattering from the patients (Compton effect) is an important factor that requires evaluation.[3]

One approach to this problem would be to reduce the scatter by attaching various thicknesses of lead (0.43, 0.86, and 1.1 mm.) to the face of the scintillation counter.[4] The percentage of uptake was determined for each of the lead thicknesses and compared with those obtained by the four-tube arrangement.

Procedure

The preliminary procedure was as follows: A 25-μc dose of I^{131} was prepared for oral administration to the patient. At the same time another 25-μc amount was prepared in an Erlenmeyer flask containing approximately 100 ml. of water; this flask served as the standard for the determination of the I^{131} uptake by the thyroid gland. As most of the I^{131} is localized in the thyroid or excreted 24 hours after administration, the uptake readings were not taken until this period of time had elapsed.

Radiological Physicist, Biophysics Department, Cancer Research Institute (Miss DeAmicis), and Group Leader and Senior Radiological Physicist, Biophysics Department (Mr. Cowing), New England Deaconess Hospital.

The patient was placed before the scintillation counter at a distance of 30 cm. from the isthmus of the thyroid at skin level to the face of the crystal. The radioactivity in the thyroid gland was then determined by subtracting the background count rate from the count rate of the thyroid. Prior to the reading the 25-μc I^{131} standard was placed in front of the scintillation counter at a distance of 30 cm. from the face of the crystal to the center of the Erlenmeyer flask. The count rate of the standard minus the background count rate gave the net count rate, or the 100% value. The percentage of uptake in the thyroid was determined by dividing the net count rate of the thyroid by the net count rate of the standard and multiplying the result by 100.

The second method for measuring the uptake of I^{131} entails the use of four Geiger-Mueller tubes connected in parallel. These tubes were positioned 90 degrees apart on the circumference of a circle having a radius of 45 cm. and were adjusted in vertical position in order to be at the height of the particular thyroid gland. From previous studies by others[2a] it has been shown that with this arrangement there exists from the center a "free circle" approximately 8 cm. in radius. This "free circle" may be termed that space within which there is less than 5% change in count rate from the count rate at the center. The Geiger-Mueller tubes were connected to a single-channel scaler.

The previously mentioned I^{131} standard was placed at the center of the circle, the counts were measured, and the count rate was determined. After this procedure the patient was positioned in a chair, and adjustments were made so that the isthmus of the thyroid was centered with the Geiger-Mueller tubes; the count rate of the patient's thyroid was determined. The net count rate of the standard and of the thyroid was obtained by subtracting the count rate of the background from each value. These corrected values were used to determine the uptake percentage in the thyroid gland.

Results

The uptake as determined by the scintillation counter and the Geiger-Mueller tube setup have been compared. The data shown in the table have been assembled in the following manner. Those figures opposite each thickness of lead are the number of determinations that had been made for each set of conditions. The deviation line shows the percentage of variance of the scintillation counter reading (with use of the different thickness of lead) from that of the four-tube Geiger-Mueller setup. It must be realized that for a given patient on whom the four determinations were made the results could be in the same percentage group, whereas readings from a second patient could vary from one percentage to another for various determinations.

The variance shown in the table indicates that the soft scatter arising from the interaction of the gamma rays from I^{131} and the patient is not completely eliminated. It appears that the scatter factor varies with each patient. An attempt was made to correlate the patient's neck size, weight, and age with the scatter factor, but no relationship could be established.

Since these data have been assembled the scintillation counter has been repaired; after this repair it was found necessary to regulate the sensitivity by adjusting the pulse-height control. With this new setting, I^{131} studies were performed. From these measurements it was found that both without lead and with 0.43, 0.86, and 1.1 mm. of lead, the uptake readings were essentially the same as those obtained with the four Geiger-Mueller tubes.

The result of this study indicates that with use of scintillation equipment for obtaining readings of I^{131} uptake by the thyroids, it seems advisable to check the possible effect of scattered radiation upon the accuracy of the uptake readings. One way this may be checked is by utilizing various thicknesses of lead to establish the presence of scattered radiation.

Comparison of Variance of Uptake in Thyroid by Scintillation and with Setup with Four Geiger-Mueller Tubes

Thickness of Lead Attached to Scintillation Counter, Mm.	Determinations Performed, No.			
0	8	12	30	16
0.43	21	35	48	2
0.86	16	33	48	1
1.10	17	28	44	3
Deviation from 4-tube setup, %	± 5	±10	±20	>±20

194 Pilgrim Road (15) (Mr. Cowing).

This work was done under a contract of the Atomic Energy Commission with the New England Deaconess Hospital.

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HEPATOTOXICITY DUE TO CHLORAMBUCIL

REPORT OF A CASE

Robert D. Koler, M.D., Portland, Ore.
and
Arthur L. Forsgren, M.D., Grants Pass, Ore.

The following case history is that of a patient who exhibited evidence of liver damage and a skin rash, which we felt to be due to chlorambucil (Leukeran). To our knowledge, this is the first report of idiosyncrasy to this drug.

A 36-year-old man developed cervical and axillary swellings in December, 1956. Except for moderate fatigue, he had no other complaints and specifically denied having had fever, sore throat, skin rash, or jaundice. His weight had remained stable at his normal of 160 lb. (72.6 kg.).

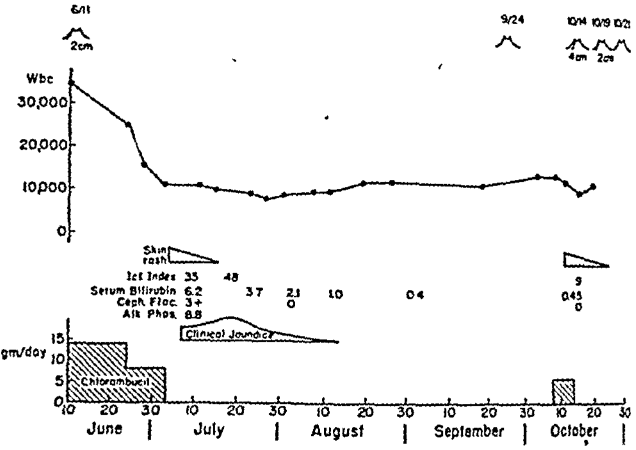
His physician found a leukocytosis, with from 15,000 to 30,000 leukocytes, predominantly lymphocytes, per cubic millimeter. Heterophil agglutination tests were negative on several occasions. Because of persistence of nontender cervical and axillary lymphadenopathy, his marrow was aspirated on March 23, 1957. An increase in the proportion of mature lymphocytes was noted in both blood and marrow (see table); however, no diagnosis was made at this time. A supraclavicular lymph node was excised on May 13, 1957, and was reported to be hyperplastic.

On June 4, 1957, he was restudied because of continued leukocytosis and lymphadenopathy. On physical examination, bilateral, firm, discrete enlargement of cervical and axillary nodes was found, the nodes ranging from 1 to 3 cm. in diameter. A sharp, nontender liver edge was felt 2 cm. below the right costal margin. The spleen was not palpable, and there were no other significant findings. A diagnosis of chronic lymphocytic leukemia was made.

Differential Blood Counts in Patient with Hepatotoxicity

	3/23/57		6/4/57
	Marrow, %	Blood, %	Marrow, %
Myeloblast	0.5	0	0
Progranulocyte	6.5	0	0
Myelocyte			
Neutrophil	15.5	0	0
Eosinophil	1 5	0	0
Metamyelocyte			
Neutrophil	13.0	0	0
Eosinophil	0.5	0	0
Band cell			
Neutrophil	7.0	1	0
Eosinophil	1.0	0	0
Segmented cell			
Neutrophil	9.0	24	13
Lymphoblast	0	1	1
Lymphocyte	11.0	57	53
Monocyte			3
Rubriblast	1.5	0	0
Hematoblast	1.5	0	0
Erythroblast	12.5	0	0
Normoblast	17.0	0	0
Disintegrated	2.0	17	30
Total	100 0	100	100

On June 14, 1957, therapy with chlorambucil, 14 mg. per day, was started. The figure summarizes the patient's clinical course after the start of therapy. The leukocyte count fell gradually to 11,000 per cubic millimeter, and on June 24, 1957, the dosage of chlorambucil was decreased to 8 mg. per day. On June 29, 1957, a generalized, nonpruritic, morbilliform rash appeared. At about the same time he noticed enlargement of the cervical lymph nodes, which had been decreasing in size. Three days later (July 2, 1957) he developed upper abdominal pain, nausea, and vomiting. Twenty-four hours later, because of clinical jaundice, chlorambucil therapy was stopped. A working diagnosis of infectious hepatitis was made because the patient had had no injections and there were no reports in the literature attributing hepatotoxicity to chlorambucil. He was never febrile, and subjective complaints were minimal except for the few days of anorexia and nausea. He was treated supportively, and within three weeks clinical jaundice and laboratory evidence of liver disease began to subside. By late August he was asymptomatic except for the persistence of enlarged lymph nodes in the axillas and neck.



Clinical course of patient after start of chlorambucil therapy.

During late September he complained of fatigue and increase in lymphadenopathy. On Sept. 24, 1957, his liver and spleen were not palpable, but increased lymphadenopathy was confirmed. Chlorambucil therapy, 6 mg. daily, was restarted on Oct. 8, 1957. Within three days the red morbilliform rash recurred on the lower abdomen and upper thighs. On Oct. 14, 1957, the patient complained of upper abdominal pain, nausea, and tenderness of cervical and axillary nodes, which he thought were slightly larger. Physical examination revealed very prominent and slightly tender cervical, axillary, and inguinal nodes. The epigastrium and right upper quadrant were tender, and the liver was felt 4 cm. below the costal margin. Chlorambucil therapy was stopped, and the patient was treated with bed rest and a low-fat, soft diet. Clinical or laboratory evidence of jaundice did not recur. The rash and hepatomegaly disappeared during the next two weeks. He has since received x-ray therapy

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From the Division of Experimental Medicine, University of Oregon Medical School (Dr. Koler).

to the cervical and axillary lymph nodes, which have decreased markedly in size. His leukocyte count dropped to 7,500 per cubic millimeter on Nov. 6, 1957. From Aug. 12, 1957, to the time of writing he has been free of symptoms and carrying on full activity.

Comment

Proof of hepatotoxicity of chlorambucil in this patient is not conclusive but rests on the time relationship of the onset of these findings during two separate courses of therapy with the drug and their prompt subsidence after withdrawal of the drug. Idiosyncracy to chlorambucil might easily go unnoticed in cases of leukemia or lymphoma, as involvement of the liver and biliary tree is a common occurence in these diseases.[1]

Summary

Hepatotoxicity, probably due to chlorambucil, occurred in a patient during two courses of therapy with this drug.

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COUNCIL ON MEDICAL PHYSICS

SYMPOSIUM ON MOUTH-TO-MOUTH RESUSCITATION (EXPIRED AIR INFLATION)

Report to the Council

The Council on Medical Physics has authorized publication of the Symposium on Mouth-to-Mouth Resuscitation (Expired Air Inflation). In this Symposium, the terms "mouth-to-mouth breathing" and "mouth-to-mouth insufflation" are used synonymously with "mouth-to-mouth resuscitation." The designation "expired air inflation" is a general term for all variations of mouth-to-mouth resuscitation. It reflects the basic physiological principle of employing expired air as the ventilating gas for all modifications of this method. This includes variations in the technique or the use of adjunctive apparatus, i. e., direct mouth-to-mouth, direct mouth-to-nose, mouth-to-mask, mouth-to-airway (oropharyngeal), mouth-to-tube (endotracheal), and mask-to-mask methods.

RALPH E. DE FOREST, M.D., *Secretary.*

INTRODUCTION

David B. Dill, Ph.D., Edgewood, Md.

It has been my privilege to have been involved for several years with investigations of artificial respiration. The first of these, conducted by Drs. Comroe, Gordon, Karpovich, and Whittenberger, led to the nation-wide acceptance of the back-pressure arm-lift method of manual artificial respiration. The history of their studies and descriptions of the preferred method and of an alternate method have been published.[1]

While manual methods were being studied, two medical officers assigned to the Army Chemical Corps, Capt. Richard J. Johns, M. C., U. S. Army (now Assistant Professor of Medicine, Johns Hopkins University Medical School, Baltimore) and Lieut. David Y. Cooper III, M. C., U. S. N. (now with the Department of Surgery, School of Medicine, University of Pennsylvania, Philadelphia), conceived the idea of a mask-to-mask resuscitator suitable for use on nerve gas casualties in a contaminated atmosphere.[2] This device is being developed by the Army Chemical Corps; it is anticipated that it will be standardized by the three medical services for military use. Dr. James O. Elam, with support from the Office of the Surgeon General, Department of the Army, and his associate Dr. Elwyn Brown were early investigators both of mask-to-mask and mouth-to-mouth artificial respiration.[3] They continued their studies while assigned as medical officers to the Army Chemical Corps and thereafter at the Roswell Park Memorial Institute, Buffalo.[4] Dr. David Greene of the University of Buffalo and Dr. Peter Safar of the Baltimore City Hospitals, also supported by the Office of the Surgeon General, Department of the Army, have joined forces with them in collaborative studies.[5] Dr. Archer S. Gordon, long an investigator with Chemical Corps aid, was supported by the American National Red Cross to

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-Deputy Director of Medical Research, Chemical Warfare Laboratories, Army Chemical Center.

extend this research to cover resuscitation of infants and small children as well as adults. Investigators supported by the Army Chemical Corps and by the Office of the Surgeon General, Department of the Army, held a conference on "Artificial Respiration and Nerve Gas Poisoning" at Denver on May 9-10, 1957. The papers on artificial respiration had to do chiefly with the mask-to-mask device since this is of primary interest to the Army Chemical Corps. In effect, it permits mouth-to-mouth breathing in a contaminated atmosphere. Since the conference brought together the most active investigators of mouth-to-mouth insufflation, plans were made for publication of the papers which made up this symposium.

The National Academy of Sciences–National Research Council (NAS-NRC) has held several discussions of artificial respiration during the past nine years. The most recent of these, on March 8, 1957, was called to consider new evidence on manual methods of artificial respiration. The *ad hoc* Panel selected by the NAS-NRC consisted of Julius H. Comroe, then Professor of Physiology and Pharmacology, Graduate School of Medicine, University of Pennsylvania, Philadelphia, and now Director, Cardiovascular Research Institute, University of California, Medical Center, Berkeley-San Francisco; David B. Dill, Chairman, Deputy Director of Medical Research, U. S. Army Chemical Warfare Laboratories, Army Chemical Center, Edgewood, Md.; Robert D. Dripps, Professor of Anesthesiology, School of Medicine, University of Pennsylvania, Philadelphia; James O. Elam, Director of Anesthesiology, Roswell Park Memorial Institute, Buffalo; Archer S. Gordon, Research Associate, School of Medicine, University of Illinois, Chicago; M. H. Sloan, Professional Associate, National Academy of Sciences–National Research Council, Washington, D. C., appointed Executive Secretary; Howard G. Swann, Professor of Physiology, School of Medicine, University of Texas, Galveston, Texas; and James L. Whittenberger, Professor of Physiology, Harvard School of Public Health, Boston.

Among those called in as discussants were Virginia Apgar, Clinical Director, Anesthesia, Presbyterian Hospital, New York; H. J. Rickard, Captain, M. C., U. S. N., Dispensary, U. S. Naval Air Station, Point Mugu, Calif.; Peter Safar, Chief, Department of Anesthesiology, Baltimore City Hospitals, and Clement A. Smith, Associate Professor of Pediatrics, Boston Lying-In Hospital.

Mr. Earl H. Breon, representing the American National Red Cross, stated the need of the Red Cross for advice in this field. A rocking method for infants and children up to 30 lb. (13.6 kg.) in weight and 34 in. (86.3 cm.) in length was described by its advocate, Capt. Harold J. Rickard, M. C., U. S. N.[6] Experiences with mouth-to-mouth breathing were presented by Drs. Apgar, Elam, Gordon, Safar, and Smith.

After hearing the evidence, the panel in executive session agreed to the following recommendations:

> The data available on the effectiveness of the manual rocking method of artificial resuscitation for infants and small children advocated by Captain H. J. Rickard are not sufficiently convincing at this time to warrant a recommendation that the American National Red Cross include a description of this method in the forthcoming revision of their first aid manual. Instead, the Panel recommended that for *emergency resuscitation of infants and small children*, a description of mouth-to-mouth resuscitation, following a preliminary maneuver to clear the airway, should be included in the revised manual.
>
> It was also recommended that all possible media of public information be utilized to disseminate information concerning the use of this method for infants and small children and that this be made a part of the instructions given to new mothers when discharged from maternity hospitals.

In the panel discussion which led to the above recommendations, the opinion was unanimous that the mouth-to-mouth method for infants and small children was preferable to the rocking method, back-pressure arm-lift, and other manual methods. The evidence that the latter methods may fail to move enough air was convincing. The panel requested Dr. Gordon to draft a description of the mouth-to-mouth method which was, in due time, circulated to other members for comment. Based on this description of the technique and of the recommendation of the panel previously quoted, the American National Red Cross prepared instructions for use by the lay public in the resuscitation of infants and small children. These were published in June, 1957, in the U. S. Armed Forces Medical Journal[7] and in the Medical Technicians Bulletin.[8] With the permission of the editors it is quoted in full.

> At the request of the American National Red Cross, the National Academy of Sciences-National Research Council convened an Ad Hoc Panel on Manual Methods of Artificial Respiration on March 8, 1957 to advise as to the best method presently available for administering artificial respiration to infants and small children. The Panel, comprising many eminent authorities on the subject, unanimously recommended the technic herein described. EDITOR

Technic for Administration

Step 1

Clear the mouth of any foreign matter with the middle finger of one hand. With the same finger hold the tongue forward.

Step 2

Now place the child in a face-down, head-down position and pat him firmly on the back with the free hand. This should help dislodge any foreign object in the air passage.

Step 3

Place the child on his back and use the middle fingers of both hands to lift the lower jaw from beneath and behind so that it 'juts out.'

Step 4

Hold the jaw in the position described in Step 3, using one hand only.

Step 5

Place your mouth over the child's mouth and nose, making a relatively leakproof seal, and breathe into the child with a smooth steady action until you observe the chest to rise. As you start this action, move your free hand to the child's abdomen, between the navel and the ribs, and apply continuous moderate pressure to prevent the stomach from becoming filled with air.

Step 6

When the lungs have been inflated, remove your lips from the child's mouth and nose and allow the lungs to empty. Repeat this cycle, keeping one hand beneath the jaw and the other hand pressing on the stomach at all times. Continue at a rate of about 20 cycles per minute. After every 20 cycles you should rest long enough to take one deep breath. If at any time you feel resistance to your breathing into the child and the chest does not rise, repeat Step 2, then quickly resume mouth-to-mouth breathing.

The three papers that follow present findings by ur groups of investigators: Greene and associates the University of Buffalo, Elam and associates at e Roswell Park Memorial Institute, Buffalo, Gor- m and associates at the University of Illinois edical School, and Safar and associates at the iltimore City Hospitals. These four groups have changed ideas and findings often enough to in- re rapid progress. Although there is not complete reement on all points, the areas of disagreement e small and of minor importance. New data ac- mulated since the panel meeting have led to odifications in the technique described. For that ason, the original illustrations have not been in- uded here. In addition, these papers deal with plications to adults as well as to children. Finally, e all have joined in a summary statement of inciples which should prove useful both to prac- ing physicians and to investigators in the field respiration.

Summary

Resuscitation with expired-air breathing is simple id effective. It is especially useful in cases of in- ry to the body. It is readily adaptable to babies, ildren, and adults without adjunct equipment. ith adjunct equipment it is adaptable to many ecialized resuscitation problems, e. g., use in ntaminated atmospheres.

Expired-air breathing should be performed with flation volumes about twice the resting tidal vol- me of the victim at a rate of 12 to 20 per minute. Reserves of pressure and volume can be mustered easily to overcome unusual handicaps. The removal of carbon dioxide and the supply of oxygen can be kept within safe limits.

Rescuers can maintain mouth-to-mouth breathing for an hour or more without fatigue even though the victim is twice the size of the rescuer.

Obstruction of the airway above the larynx is the most common cause of failure of any method of artificial respiration. In expired-air breathing, this type of obstruction is prevented, for the hands are free to keep the head extended at the atlanto-occipital joint (sniffing position) and the lower jaw displaced forward.

If there is an obvious mechanical obstruction in the airway, the first step is to remove it. If there is no such obvious obstruction, mouth-to-mouth breathing is begun at once. It permits breath-by-breath assay of the presence of obstruction, degree of inflation, and degree of relaxation of the victim's chest.

Skillful performance of expired air breathing is an easily learned, lifesaving procedure. It has revived many victims unresponsive to other methods and has been proved in real emergencies under field conditions. Information about expired air breathing should be disseminated as widely as possible.

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MOUTH-TO-MOUTH VERSUS MANUAL ARTIFICIAL RESPIRATION FOR CHILDREN AND ADULTS

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In the field of manual artificial respiration, a general crystallization of ideas occurred several years ago as a result of extensive research on adult human subjects.[1] This led to acceptance of "push-pull" manual resuscitation methods on a national basis.

The results of these investigations were also applied to infants and small children although comparable specific data were not available for these age groups. Many manual methods have been proposed for children, but there has never been a controlled, comparative study of their efficiency.

In October, 1955, a technique for resuscitation of infants and small children by means of manual tilting on the forearm of the rescuer was recommended by Rickard.[2] In essence, he utilized the principle of the Eve rocking method.[3] An important addition was use of the rescuer's finger in the victim's mouth to provide a "continuous digital airway." This interesting suggestion was not supported by any factual information which could justify its acceptance. However, it served to emphasize once again the necessity for determining the best method of manual artificial respiration for infants and small children.

The American National Red Cross was keenly aware of this problem and acted to resolve it through the consultative services of the National Academy of Sciences–National Research Council. This agency decided that carefully controlled, comparative studies were required to evaluate resuscitation methods for infants and small children before any recommendations could be made. Accordingly, the American National Red Cross provided support for this evaluation under the auspices of the National Academy of Sciences–National Research Council. The authors undertook this investigation of manual and mouth-to-mouth methods in infants and small children; the results are reported in part 1.

A similar evaluation in adults developed as a natural consequence of the interesting results found in the studies on children. Elam and co-workers [4] had already performed extensive investigations to perfect the Cooper-Johns mask-to-mask device for resuscitation of chemical warfare casualties in a contaminated atmosphere.[5] Their studies established this method on a sound physiological and practical basis for adults. It appeared that the ease and efficiency demonstrated with mask-to-mask resuscitation should be equally applicable to resuscitation emergencies when mask devices are neither available nor necessary.

However, direct mouth-to-mouth resuscitation, sometimes referred to as the Biblical method,[6] had not been compared to the manual push-pull techniques in controlled adult human tests. Accordingly, such studies were performed under a research contract with the U. S. Army Chemical Warfare Laboratories, Edgewood, Md. They are reported in part 2.

Requirements for Evaluation of Resuscitation Methods

It is generally agreed by medical and rescue authorities that controlled, comparative studies must be performed in order to evaluate objectively the various methods of resuscitation. This require that the test subjects resemble victims in need o artificial respiration, unconscious and apneic, and that all methods under consideration are compared under the same circumstances and on the same subjects. The critical data required to assess the comparative efficiency of factors such as ventilation airway obstruction, circulation, and fatigue can be provided only in this way.

Actual resuscitation experiences provide practical information regarding details of performance, but they are not reliable for determining the best method. In some cases, a method may be given credit for a successful rescue when the patient did not even require artificial respiration; no resuscitation or some other procedure would have succeeded as well or better. In other cases, failure to resuscitate a victim may incriminate the method used, although there was no indication whether the victim was beyond help by any means or whether some other technique might have been more useful if tried. This does not reduce the value of case reports, but it emphasizes their limitations as a means for determining the comparative efficiency of resuscitation methods.

Part 1—Evaluation of Ventilation and Airway Obstruction Factors in Infants and Small Children

The studies in this section were performed on normal infants and small children who were admitted to the hospital for elective circumcision

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under general anesthesia. Prior to the surgery, a series of manual artificial respiration methods and mouth-to-mouth breathing were performed on them while they were anesthetized and temporarily apneic from hyperventilation and small doses of succinylcholine (Anectine, Quelicin, Sucostrin) chloride.

The methods were performed as illustrated in figures 1 and 2. The three push-pull manual methods, back-pressure arm-lift, back-pressure hip-lift, and chest-pressure arm-lift (Silvester), have an active inspiratory and an active expiratory phase. Previous studies in adults have established the ventilatory [7] and circulatory [8] adequacy of these methods. Manual rocking also has an active inspiratory and an active expiratory phase. It was performed with the patient in both the prone and supine positions and with varying degrees of rocking.

Tidal volumes resulting from application of the methods were measured on a recording spirometer for infants. The various techniques were performed both with and without an ideal (endotracheal) airway. In five cases, endotracheal tubes were inserted into the airway and were connected to the spirometer. Ventilation was measured continuously during performance of the manual methods. For mouth-to-mouth resuscitation, the operator breathed into the patient's airway after which the endotracheal tube was clamped and connected to the spirometer. The clamp was then released, and the expiratory tidal volume was measured.

In nine cases, ventilation was measured without an endotracheal tube. Instead, a basal metabolism apparatus type of rubber mouthpiece was inserted between the lips and teeth, and a nose clamp was placed on the nostrils. The mouthpiece was held in place and sealed to the lips by means of adhesive strips. This technique left the jaw and tongue unrestrained and allowed them to assume their natural position during the performance of each method. This provides a measure of partial or complete airway obstruction which may result with the various methods. The mouthpiece was connected to the spirometer for continuous recording during performance of the manual methods. For the mouth-to-mouth insufflation, the operator breathed into the airway, after which a short extension from the mouthpiece was clamped; the extension was connected to the spirometer, and the expiratory tidal volume was measured when the clamp was removed.

The use of a continuous digital airway appeared to be a noteworthy contribution to any manual method, and it was used whenever possible in these studies. A small slit was made in the rubber mouthpieces for insertion of the index or middle finger of the operator. These nine patients were studied both with and without the digital airway in all manual methods except the back-pressure arm-lift procedure. This method requires the operator to use both hands to perform the arm-lift, leaving neither hand free to provide the digital airway.

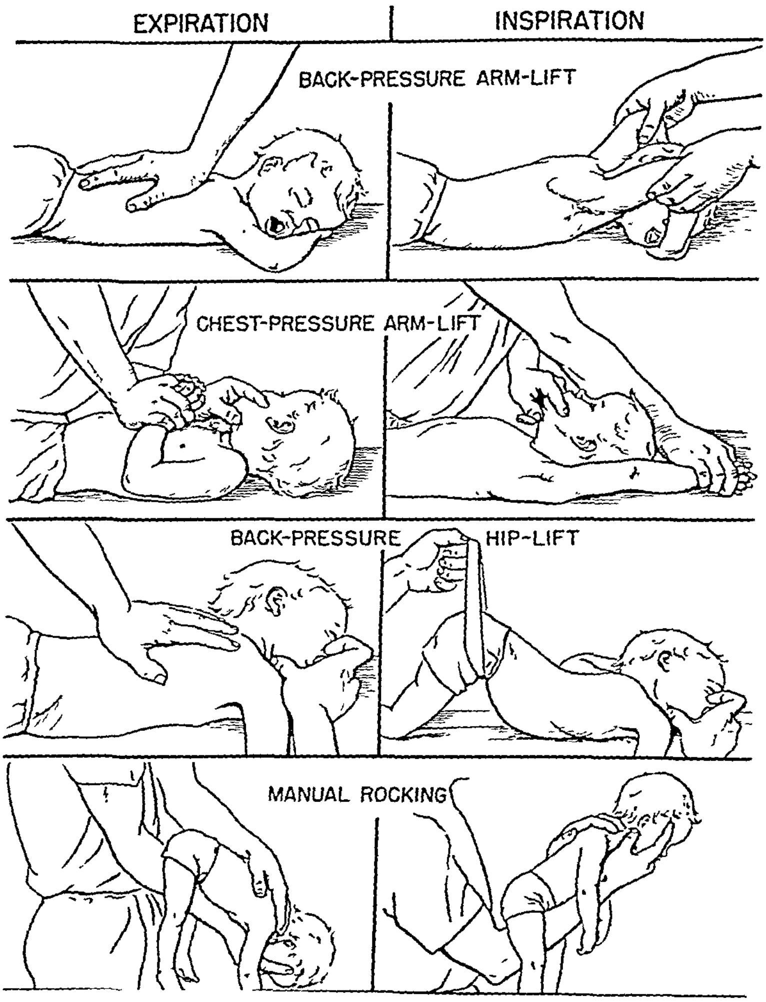

Fig. 1.—Push-pull manual artificial respiration.

The airway pressure differentials were measured in a static system on the patients who had endotracheal intubation. This was done by connecting an electromanometer and electronic dual pen recorder between the endotracheal tube and the spirometer. During several cycles of each manual method, the spirometer was clamped out of the circuit and the inspiratory and expiratory phases were sustained, during which the static pressures in the airway were recorded. For the mouth-to-mouth method, static airway pressure was measured on the same recording system from a pressure tap in the patient's mouth.

Results

The results of the ventilatory studies are recorded in tables 1 and 2. When the endotracheal tube was used to provide an ideal, unobstructed airway, mouth-to-mouth insufflation always provided maximal pulmonary ventilation. This was between two and three times the normal resting tidal volumes. All three manual push-pull techniques provided comparable amounts of ventilation, which were only one-half to two-thirds as much as that produced by mouth-to-mouth breathing. All variations of manual rocking were significantly inferior and resulted in less ventilation than the resting tidal volumes, even when the feet-down angle was increased to 60 degrees.

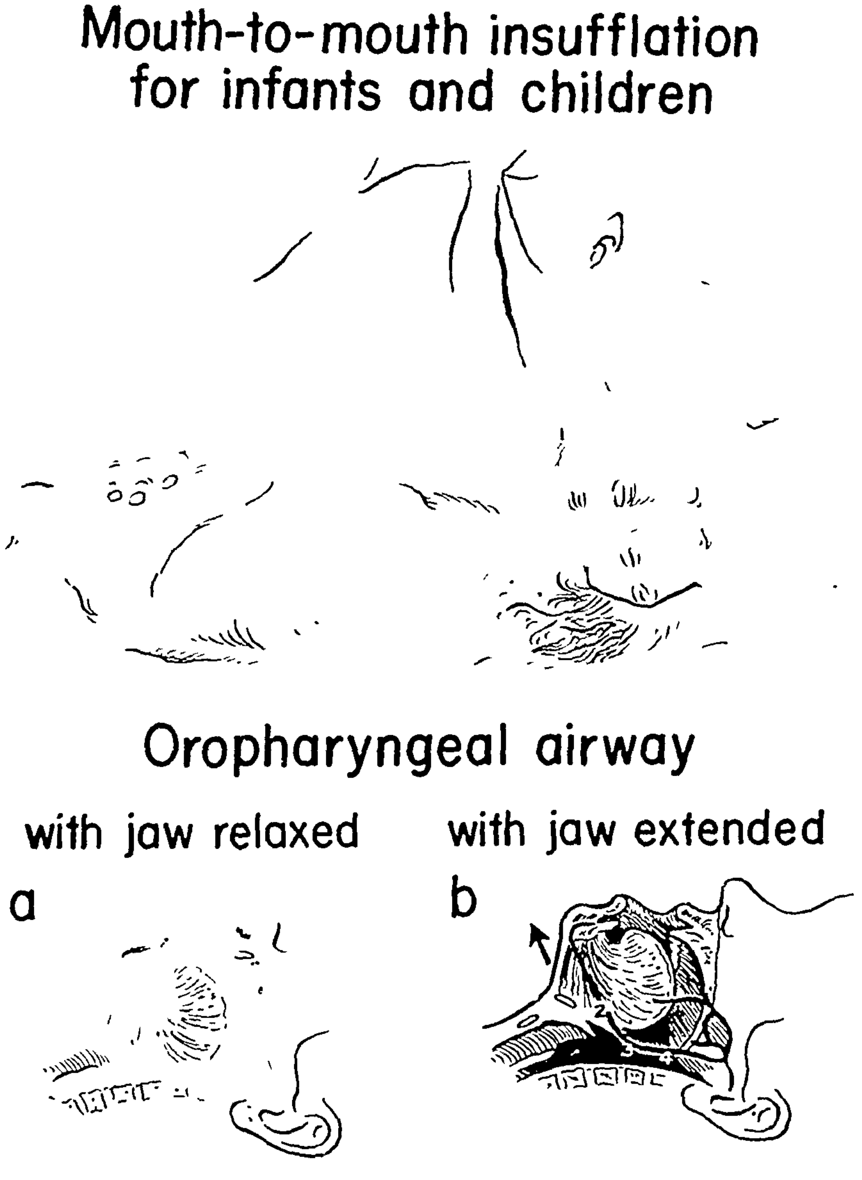

Fig. 2.—Technique for mouth-to-mouth resuscitation.

When the mouthpiece and noseclip were used, mouth-to-mouth resuscitation resulted in essentially as much ventilation as with use of an endotracheal tube, and every patient was adequately ventilated. All patients were ventilated when a digital airway was used with the three push-pull manual methods, but the tidal volumes were significantly less than with mouth-to-mouth breathing or when these same methods were applied with an endotracheal tube in the airway. When the digital airway was not used, only one-half of the patients were ventilated with manual push-pull methods.

When the variations of manual rocking were applied to the patients with a mouthpiece and noseclip, only one-half of them were ventilated, even with use of a digital airway. The ventilatory volumes in those patients who were ventilated were always less than the resting tidal volumes.

The mean airway pressure differentials with the various methods are summarized in table 3. The manual push-pull methods and mouth-to-mouth resuscitation resulted in the same range of pressure differenials. However, manual rocking provided less than one-third as much of a pressure gradient.

Comment

The studies detailed here demonstrate the unequivocal superiority of mouth-to-mouth breathing over all manual methods of resuscitation for infants and small children. During these tests it was possible to note the advantages of this method and to evolve a technique for optimum ventilation of the patient.

Technique for Mouth-to-Mouth Resuscitation

1. The infant is placed in the supine position with the head extended, and the rescuer is stationed at the side of the head. He places the fingers of both hands beneath and behind the angles of the lower jaw and lifts vertically upward, so that it juts out into a position of prognathous (see fig. 2). This is the most important step in the entire procedure since it effectively clears the oropharynx of obstruction by the tongue. In the unconscious patient the jaw relaxes, and the tongue gravitates against the posterior pharyngeal wall to occlude the oropharynx (fig. 2*A*). When the mandible is extended by lifting it upward until there is partial temporomandibular separation, the hyoid bone and floor of the mouth are also drawn upward. This maneuver makes forward displacement of the tongue obligatory, since it is attached to the mandible, hyoid bone, and floor of the mouth (fig. 2*B*).

2. The rescuer places his mouth over the mouth and nose of the infant or child and breathes into the airway (expired air inflation). If the jaw is being held properly and if there is no foreign body obstruction, the rescuer will feel the victim's lungs expand. He breathes into the mouth and nose until he sees the chest wall rise adequately and/or he *feels the resistive force exerted by the expanded* lung and chest wall. The rescuer then removes his mouth and allows the lungs to deflate passively.

3. As soon as patency of the airway has been established, the operator may move one hand to the epigastrium where it is used to exert continuous moderate pressure between the costal margin and the umbilicus. This prevents air from passing down the esophagus to cause gastric distention. In the unconscious infant, this hand pressure also results in an easy "belching up" of previously swallowed air. During these studies, failure to exert pressure on the epigastrium usually resulted in massive gastric distention. This may be deleterious to both ventilation and circulation since the distended stomach elevates the diaphragm and may significantly reduce lung volume; in addition, a dilated stomach may seriously impair venous return to the heart.

Pressure on the stomach may also result in regurgitation of water swallowed during submersion or of recently ingested food, especially infant formulas. If this occurs, the child should quickly be turned into the prone, head-down position to insure adequate drainage.

4. As the mouth-to-mouth breathing is continued, the jaw is kept elevated at all times. An inadequate lift can be detected immediately by *inability or difficulty in ventilating the lungs.* When this is noted, the lift on the jaw should be renewed. If the jaw cannot be properly elevated with one hand, both hands should be used, even at the expense of gastric dilatation. A free and unimpeded airway is the lifeline to successful resuscitation. If necessary, air accumulated in the stomach can be evacuated by epigastric pressure applied *periodically* when convenient.

TABLE 1.—*Pulmonary Ventilation During Artificial Respiration on Five Apneic Infants*

Infant			Tidal Volume with Endotracheal Intubation, Cc./Respiratory Cycle								
								Manual Rocking			
								Prone		Supine	
Case, No.	Age, Mo.	Weight, Kg. (Lb.)	Sleeping Tidal Volume	Mouth-to Mouth	Silvester	Back-Pressure Arm-Lift*	Back-Pressure Hip-Lift†	45°-45°‡	30°-60°§	45°-45°	30°-60°
1	5	6.8 (15)	32	88	46	41	58	18	20	22	25
2	12	10 (22)	48	142	98	62	106	24	28	30	36
3	24	14 (31)	62	168	110	86	116	35	42	45	50
4	30	13.6 (30)	87	206	124	111	133	42	46	52	62
5	36	17.2 (38)	94	268	206	164	210	65	72	86	90

* In all cases, arm-lift alone gave values of 30 to 50% of back-pressure arm-lift.
† In all cases, hip-lift alone gave values of 35 to 45% of back-pressure hip-lift
‡ Indicates rocking from 45° head-down position to 45° feet-down position.
§ Indicates rocking from 30° head-down position to 60° feet-down position.

TABLE 2.—*Pulmonary Ventilation During Artificial Respiration on Nine Apneic Infants*

Infant			Tidal Volume with Mouthpiece and Noseclip, Cc /Respiratory Cycle*								
					Silvester		Back-Pressure Arm-Lift	Back-Pressure *Hip-Lift*		Manual Rocking	
Case, No.	Age, Mo.	Weight, Kg. (Lb.)	Sleeping Tidal Volume	Mouth-to-Mouth	(A)	(B)	(B)	(A)	(B)	Prone 45°-45°†	Supine 45°-45°†
1‡	5	6.8 (15)	32	86	16	0	0	26	0	0	0
2‡	12	10 (22)	48	140	58	40	81	131	106	10	6
3	17	11.3 (25)	56	122	13	0	0	38	0	0	0
4	18	10.4 (23)	58	148	58	38	44	88	72	0	0
5‡	24	14 (31)	62	134	40	30	22	81	40	0	0
6	28	14 5 (32)	70	184	66	0	0	87	0	0	0
7‡	30	13 6 (30)	87	196	25	0	0	140	88	26	0
8	32	16.3 (36)	88	220	16	0	0	47	0	13	20
9‡	36	17.2 (38)	94	260	62	78	16	87	30	25	22

* In each series, (A) = results obtained when method was performed with operator's finger in mouth to keep airway clear. (B) = results obtained without operator's finger in airway. Since back-pressure arm-lift requires operator to use both hands, all measurements were made without operator's finger in airway.
† Indicates rocking from 45° head-down position to 45° feet-down position.
‡ Same cases as in table 1.

5. For infants and small children, the inflation rate should be at least 20 times per minute. If the rescuer begins to develop hyperventilation alkalosis, as evidenced by dizziness, lightheadedness, and numbness or tingling in the fingers, he should slow his rate of resuscitation or stop to take one normal breath each minute. The amount of *expired air* insufflated into the child will vary according to the patient's size. This amount can be accurately determined by feeling the lungs expand and by watching the chest wall rise and fall. For newborn

or tiny babies, Apgar recommends insufflation with *small "puffs"* of air from just the mouth and cheeks.

6. If it is apparent that foreign material is in the airway, the initial maneuver should be to clear the airway. Obvious or large bits of material in the mouth or oropharynx can often be retrieved by sweeping the index or middle finger through these cavities. Supralaryngeal obstructions, such as thick secretions or vomitus, are less accessible. In this situation the rescuer should quickly place the child in the prone, head-down position on his forearm and insert his middle or index finger into the mouth to depress the tongue and draw it forward. Several firm pats on the back may then dislodge the obstruction.

If this does not relieve the obstruction, valuable time should not be lost in pursuing this routine further. Adequate elevation of the jaw and mouth-to-mouth breathing should be reinstated immediately. By breathing slowly into the child's airway, even partial obstructions can be bypassed, and all tients but those with complete obstructions can e ventilated to some degree.

TABLE 3.—*Mean Airway Pressure in Static System During Artificial Respiration on Apneic Intubated Subjects*

Method	Mean Airway Pressure, Mm.Hg					
	5 Normal Male Infants and Children*			8 Normal Adult Males†		
	Expir.	Inspir.	Differential	Expir.	Inspir.	Differential
Mouth-to-mouth	0	+14	14	0	+15	15
Silvester	+8	−4	12	+6	−5	11
Back-pressure arm-lift	+9	−4	13	+8	−5	13
Back-pressure hip-lift	+10	−4	14	+8	−7	15
Rocking						
Prone	+2	−2	4	...	...	...
Supine	+2	−2	4	...	...	...

* Same cases as in table 1.
† Same cases as in table 4.

Advantages of Mouth-to-Mouth Resuscitation

No one method of resuscitation has all of the advantages which might be desired. However, the advantages of mouth-to-mouth breathing exceed the disadvantages. These advantages are listed as follows:

1. Adequate ventilation is the *sine qua non* of resuscitation. As revealed by these studies, mouth-to-mouth breathing is unequivocally superior to all manual resuscitation methods in ensuring adequacy of pulmonary ventilation. This applies to the natural airway as well as to the ideal airway provided by an endotracheal tube. The double to triple tidal volumes which result with this method are desirable in resuscitation emergencies to overcome the initial hypoxia and hypercapnia and to prevent their recurrence.

The push-pull manual techniques could only be relied upon to provide ventilation when the so-called digital airway was used. Even with this adjunct, the amount of ventilation frequently was less than the resting tidal volume. This indicates that the term "digital airway" is a misnomer. The finger is a solid object which does not promote the flow of gases. The only way in which this digit can promote ventilation is to use it for maintaining extension of the neck or jaw. For the manual methods this involves grasping the mandible between the thumb inside the mouth and the middle finger outside the mouth and forcibly lifting or pulling the jaw to extend it. In the rocking method, this involves simultaneously balancing the baby and keeping it on the stretch on the forearm so that its own weight does not result in shift of position which causes flexion of the neck or retraction of the jaw. In actual practice these manipulations become somewhat cumbersome, as revealed by figure 1, and somewhat inefficient, as revealed by table 2.

All variations of the manual rocking technique provided less ventilation than the resting tidal volumes, even with an ideal (endotracheal) airway. In previous studies on apneic, unconscious adults, we found that rocking resuscitation provided more ventilation than the resting tidal volumes but less than the push-pull manual methods.[9] However, the reduced ventilation in this study is consistent with the observations of Colville, Shugg, and Ferris[10] that rocking resuscitation in infants should provide proportionately less ventilation than it does in adults.

2. Airway obstruction, either anatomical or mechanical, is the most serious detriment to adequate ventilation. Mouth-to-mouth breathing is the only technique which allows the rescuer to be stationed at the patient's head for constant monitoring of the airway and its patency. With this method, partial or complete airway obstruction can be detected on a breath-to-breath basis and, when detected, can be treated immediately by correction of the jaw position or clearing of the airway. With none of the manual methods is the operator able to determine for sure whether he is ventilating the patient.

3. With normal respiration, expired air contains approximately 16% oxygen and 4% carbon dioxide. A common misconception is that this slightly lowered oxygen level and elevated carbon dioxide concentration will perpetuate the hypoxia and hypercapnia already present in victims requiring resuscitation. The studies of Elam and others[4a] have conclusively revealed the adequacy of oxygenation and carbon dioxide elimination with tidal volumes of 1,000 cc. or more at a rate of 12 to 20 times per minute for prolonged periods of mouth-to-mouth resuscitation in adults. Accordingly, ventilation of infants or children at two to three times their rest-

ing tidal volumes at rates of 20 or more per minute should be equally adequate in preventing hypoxia and hypercapnia.

The first 150 cc. of the rescuer's expired air is the dead space air, which is the terminal portion of his previous inspiration. This only serves to fill the tracheobronchial tree and is not involved in alveolar gas exchange. It maintains nearly the same composition as atmospheric air. This dead air is the first gas exhaled by the rescuer into the child's lungs. In children up to two or three years of age, this expired dead air, which has almost a normal atmospheric oxygen and carbon dioxide content, constitutes their entire tidal volume. In children, this provides further insurance against expired air inflation resulting in hypoxia or hypercapnia. To assure a nearly atmospheric composition of the dead air, the rescuer should always take an inspiration just before each mouth-to-mouth insufflation.

4. The energy expenditure of mouth-to-mouth breathing is less than that of any manual method. Manual rocking becomes quite tiring on the arm, especially with large or heavy infants, or if continued for a long period of time. Mouth-to-mouth breathing can usually be continued for hours by most operators.

5. Manual rocking has been proposed for children weighing 3.1 to 12.7 kg. (7 to 28 lb.) who are approximately one week to 2 years old.[2] This limitation does not apply to mouth-to-mouth resuscitation. It has been found ideal for infants and small children in this study, but it can be applied equally well to older children and adults. It thus becomes a universal method for all ages and sizes. Practical field tests have indicated that even small or young individuals can perform mouth-to-mouth breathing satisfactorily on subjects much larger than themselves.

6. As detailed here, mouth-to-mouth breathing can be performed without any equipment or adjuncts. It can be used by housewife, lifeguard, nurse, or doctor in any emergency. When available, the use of masks, oropharyngeal airways, or endotracheal tubes facilitates mouth-to-mask, mouth-to-airway, or mouth-to-tube ventilation. The use of these devices is detailed elsewhere in this Symposium, but their use should not be considered essential to the adequate performance of this technique.

7. Mouth-to-mouth breathing can easily be used for assisting the respiration of victims or patients with severe respiratory insufficiency. The operator either assists each spontaneous respiration or interposes full inflations between breaths if the rate is very slow. This type of assistance can also be used to supplement the respiration of a previously apneic patient when he first begins to breathe again.

8. The circulatory effects of artificial respiration are important, but they remain a secondary consideration. Once the adequacy of ventilation has been assured, the effects of the method on circulation merit consideration.

Mouth-to-mouth resuscitation is a form of intermittent positive pressure breathing. Extensive studies have detailed the effects on circulation resulting from various types of pressure breathing, and these have been reviewed recently by Whittenberger.[11] In the presence of a depressed or unstable cardiovascular system, a high mean airway pressure is deleterious to circulation. The degree of circulatory depression is directly proportional to the amount of positive pressure applied, the duration of its application, and the resultant mean airway pressure. Studies on various types of pressure breathing by Gordon and others [12] have indicated that such deleterious circulatory effects can be minimized by avoiding excessive positive pressure during inflation and by timing the phases so that the inspiratory phase occupies only one-third and the expiratory phase two-thirds of each cycle. This lowers the mean airway pressure and allows cardiovascular compensation during the longer expiratory phase.

Circulatory studies have not shown any remarkable differences between the effects of manual push-pull techniques and rocking resuscitation.[8] The special circulatory benefits claimed for rocking resuscitation have never been well substantiated.[11]

In the final analysis, the more adequate the ventilation without serious impairment of circulation, the more adequate is the method. Rocking resuscitation has a special application in certain situations, such as for convalescent poliomyelitis patients, in whom complete apnea and airway obstruction are not major problems. However, its use for emergency resuscitation of infants and small children is ill-advised on the basis of its ventilatory insufficiency and difficulty in maintaining a patent airway.

9. As indicated previously, controlled, comparative studies are essential for establishing the best method of resuscitation on the basis of factual criteria. Actual field and hospital experiences then serve to support and extend such work. In this regard, it is worthy of note that the National Academy of Sciences–National Research Council has already compiled a series of cases which indicate the ease and efficiency of mouth-to-mouth resuscitation in hospital, home, and field situations.

Resuscitation by manual rocking, manual push-pull, and other methods will sometimes be used successfully. Success by any method is always gratifying. However, in those cases in which patency of the airway and adequacy of ventilation are crucial factors, mouth-to-mouth breathing must be regarded as the most efficient method. In our experience, it is always the method of first choice.

10. The National Academy of Sciences–National Research Council has recommended mouth-to-

mouth breathing for emergency *resuscitation of infants* and small children. This recommendation has been accepted by the American National Red Cross.

Part 2—Evaluation of Ventilation and Airway Obstruction Factors in Apneic Adults

Extension of these studies to adults involved use of similar experimental design and methods. The three push-pull manual methods were compared with direct mouth-to-mouth resuscitation on a series of eight normal adult male subjects who were temporarily apneic from administration of succinylcholine chloride while under general anesthesia. All methods were tested on each subject, first with a cuffed endotracheal tube in the airway and then with a basal metabolism apparatus–type mouthpiece between the lips and teeth and a clip on the nose. Tidal volumes and airway pressures were measured as previously detailed. The manual methods were performed as illustrated in figure 3 and the mouth-to-mouth and mouth-to-nose resuscitation as shown in figure 4.

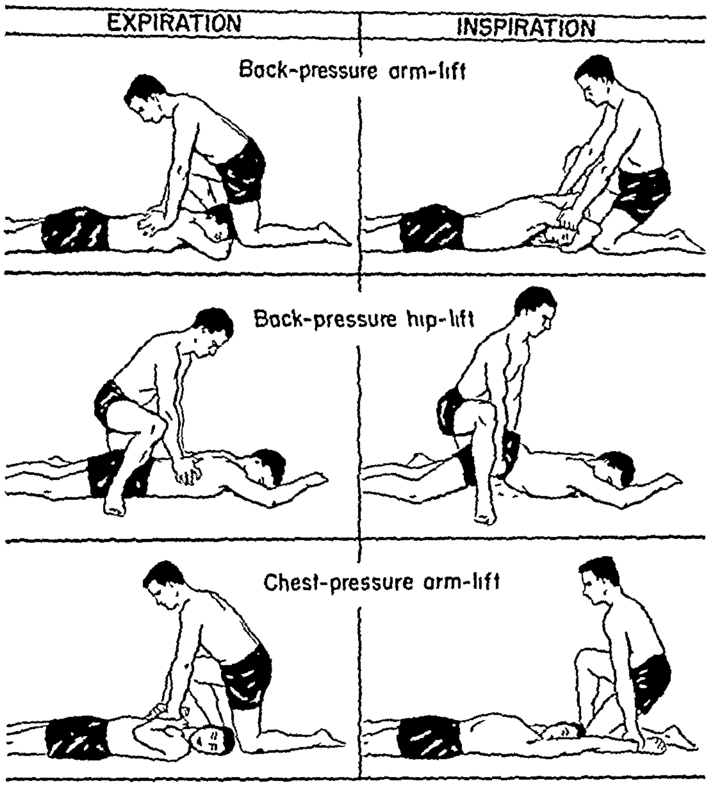

Fig. 3.—Push-pull manual artificial respiration.

Results and Comment

Push-pull manual methods and mouth-to-mouth resuscitation provided about the same amounts of ventilation when an endotracheal tube was used (table 4). These values were twice the resting tidal volumes and in the same range as those observed in previous studies on this type of subject.[13]

When the mouthpiece and noseclip were substituted for the endotracheal tube, several important observations were made. 1. Every subject was ventilated adequately with mouth-to-mouth insufflation, and there was *only a small (10%) decrease in ventilatory volumes.* 2. Only 50 to 75% of the subjects were ventilated by the manual methods. Even those who were ventilated had partial airway obstruction as evidenced by a reduction of 40 to 50% in ventilatory values.

These points are of crucial importance in illustrating that a single rescuer can assure almost ideal ventilation *in every case* with mouth-to-mouth resuscitation, whereas the push-pull manual methods do not ventilate some patients at all and only partially ventilate the remaining ones.

Mouth-to-mouth resuscitation has additional important advantages. If partial or complete airway obstruction occurs, it can be detected immediately by noting *resistance to breathing* or failure of the patient's chest to rise and fall with each insufflation. The cause can then be remedied, whether it is malposition of the jaw, a foreign body, or mucus. This is the only method which allows immediate diagnosis of the adequacy of ventilation on a breath-to-breath basis. Furthermore, even in the presence of partial obstruction, it is possible to ventilate the victim, at least partially, by increasing the pressure used or by slowing the rate of inflation in order to by-pass the obstruction. When special attention to the airway is required, the rescuer is ideally placed near the patient's head.

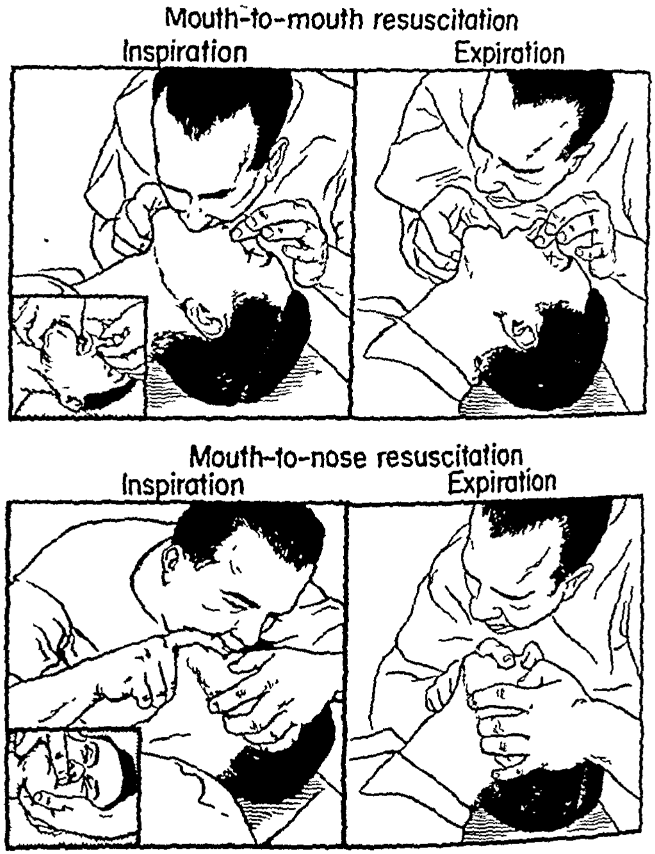

Fig. 4.—Techniques for mouth-to-mouth and mouth-to-nose resuscitation.

The results noted in table 4 approximate those of Elam and co-workers, as reported elsewhere in this symposium. They ventilated adult subjects with tidal volumes of 1,000 cc. and found that this could maintain normal arterial oxygen saturation and carbon dioxide elimination with ventilatory rates of 12 to 20 per minute. In their experiences, they found that expired air methods could be performed easily for one hour and usually much longer.

The airway pressures resulting with the various methods are shown in table 3. All of the methods resulted in the same range of pressure differentials. although the back-pressure hip-lift method and mouth-to-mouth procedure had slightly higher pressures than the others. But only with mouth-to-mouth insufflation can this pressure be increased or its rate of delivery slowed to overcome partial airway obstruction.

As detailed in part 1, the circulatory effects of positive airway pressure can be minimized in adults also by avoiding excessive inflation pressure and by timing the mouth-to-mouth breathing so that inspiratory duration occupies one-third and expiratory duration two-thirds of each cycle.

Several techniques for applying direct mouth-to-mouth resuscitation were evaluated during these studies, and those found best are shown in figure 4. The subject is placed in the supine position with his head extended and the rescuer at the side of the head. Proper and adequate elevation of the lower jaw is the single most important factor in maintaining a free and unobstructed airway. As illustrated in figures 2*A* and *B*, proper elevation of the jaw draws the hyoid bone and muscular attachments of the floor of the mouth and the base of the tongue forward to maintain an unobstructed oropharyngeal airway.

This may be accomplished in several ways, but it is best accomplished for direct mouth-to-mouth resuscitation by having the rescuer grasp the lower jaw of the victim between his thumb and index finger and lift it vertically upward (fig. 4). The other thumb and index finger are used to clamp off the nostrils. The rescuer then places his mouth over the victim's mouth, making a relatively leakproof seal. He breathes into the airway with short, smooth, even exhalations. These are maintained only long enough to provide good inflation of the victim's lungs. The ventilatory volume and pressure required are easily judged by the rescuer. He inflates the lungs until he feels the resistive force of the expanded lung and thorax and/or notes the smooth rise of the chest. The operator then removes his mouth from the victim's face and allows him to exhale. The cycle should be repeated 12 to 20 times per minute.

For mouth-to-nose resuscitation, the rescuer elevates the lower jaw of the victim by lifting with the fingers of both hands behind the angles, as described previously. He then places his mouth over the victim's nose and inflates the lungs. His cheek may be used to occlude the lips, or one finger may be placed over them, as illustrated in figure 4. Mouth-to-nose breathing always worked effectively in these studies. However, in cases with nasal obstruction from edema, mucus, or submersion, mouth-to-nose breathing may be limited or impossible.

In adults, both hands are usually required to keep the jaw elevated and the nose occluded, and it is not possible to move one hand to the epigastrium to prevent gastric distention. This may be done periodically when necessary, or a second rescuer may perform this function. In these studies on adults, distention of the stomach with gas was not as prominent a feature as in the studies on apneic, unconscious children. Apparently further development of the anterior abdominal wall reduces this hazard in the adult. Gastric distention is always less when a patent airway is maintained.

It is important to know that with proper elevation of the jaw to maintain a clear airway, either mouth-to-mouth or mouth-to-nose insufflation can be used to ventilate the lungs effectively. When the rescuer detects airway obstruction with one technique, he can immediately try the other one.

TABLE 4.—*Mean Pulmonary Ventilation During Artificial Respiration on Eight Apneic Normal Adult Male Subjects*

		Mouthpiece & Noseclip	
Method	Cuffed Endotracheal Tube, Cc. Respiratory Cycle	Cc Respiratory Cycle	Case-Actually Ventilated, %
Normal resting tidal volume.	540		...
Mouth-to-mouth	1,020	910	100
Silvester	920	450	50
Back-pressure arm-lift.	950	580	62.5
Back-pressure hip-lift	1,000	650	75

During mouth-to-mouth breathing on adult patients, the operator may note evidences of hyperventilation alkalosis. If this occurs, he should slow his rate or stop once each minute for a normal respiratory cycle of his own.

The effectiveness and ease of performance of mouth-to-mouth breathing can be improved by the use of such adjuncts as an ordinary anesthesia face mask, an oropharyngeal airway, or an endotracheal tube. These are useful, and mouth-to-mask, mouth-to-airway, and mouth-to-tube breathing should be encouraged when these devices are available. However, absence of this paraphernalia should not discourage either medical or lay persons from performing direct mouth-to-mouth or mouth-to-nose breathing in the home, hospital, or field situation.

Summary

Detailed comparative studies of mouth-to-mouth breathing and manual artificial respiration have been performed on temporarily apneic, unconscious infants, small children, and adults.

These studies have indicated the unequivocal superiority of mouth-to-mouth resuscitation over all manual methods in all age groups. Mouth-to-mouth breathing is the only technique which assures adequate ventilation in all cases. With the manual push-pull methods and manual rocking, complete obstruction of the airway occurred in a significant number of subjects; partial airway obstruction was noted in all of the other cases.

The single most important factor in assuring adequacy of ventilation is proper extension of the neck and elevation of the jaw. The most useful technique for performing mouth-to-mouth breathing in infants and small children involves a specific series of actions; this is also true of the best techniques for performing direct mouth-to-mouth and mouth-to-nose resuscitation on adults.

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OXYGEN AND CARBON DIOXIDE EXCHANGE AND ENERGY COST OF EXPIRED AIR RESUSCITATION

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This report reviews results of several studies of expired air resuscitation carried out in our laboratories over four years.[1] After a preliminary survey in 1952, a coordinated series of measurements were made in Buffalo, Baltimore, and at the Army Chemical Center, Edgewood, Md. These projects were sponsored by the Office of the Surgeon General, Department of the Army, because of the urgency of problems of resuscitation in nerve gas poisoning. Requirements called for a method of artificial respiration possessing high efficiency, simplicity, and inherent safety. The data reviewed here have been the basis for recent adoption in principle by the Army of expired air resuscitation as the field method of choice in the treatment of nerve gas casualties

The possibilities of using the expired air of one person to ventilate another are apparent from simple calculations. The concentration of oxygen in expired air is dependent upon the oxygen consumption, the ventilation, and the concentration of oxygen in the inspired air, ordinarily 21%. Thus, a man consuming 300 cc. of oxygen per minute and breathing 5 liters of air per minute takes into his lungs 1,050 cc. of oxygen, extracts 300 cc., and exhales the remaining 750 cc. at a concentration of 15% oxygen in the expired air (table 1). If he doubles his breathing volume, his oxygen consumption is essentially unchanged. He now breathes 10

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liters of air per minute, taking into his lungs 2,100 cc. of oxygen, extracting 300 cc., and exhaling the remaining 1,800 cc. at a concentration of 18% oxygen in the expired air. Thus, a hyperventilating rescuer can offer a nonbreathing victim 10 liters of air per minute containing 1,800 cc. of oxygen. The victim's oxygen requirement of 300 cc. per minute will be provided by the 10 liters of air containing 18% oxygen per minute, leaving a normal expired air concentration of 15% oxygen (table 1). Thus, by adequate hyperventilation, a rescuer can easily provide for normal oxygenation of the victim.

Similar considerations applied to the elimination of carbon dioxide show that the hyperventilating rescuer will inflate air containing only 2% carbon dioxide instead of the normal 4%. It follows that adequate carbon dioxide removal is easily attainable by expired air resuscitation. Therefore, objections to the ancient method, based on the supposition that the expired air of the rescuer will be too low in oxygen ,and too high in carbon dioxide, neglect the hyperventilation we propose in performing this method.

The physical ability of the rescuer to perform the method is also predictable. Doubling the average tidal volume requires only 20% of the vital capacity, leaving 80% to overcome unpreventable leaks. Blowing this volume into a victim ordinarily requires 15% of the available expiratory pressure. The remaining 85% of his available pressure is reserved to overcome whatever unusual resistance may be encountered in inflating the victim's airway and chest. Although these reserves in volume and pressure allow the rescuer to surpass safe limits, he can be trained to avoid excesses by utilizing his proprioception. From these estimates, it is postulated that (1) healthy rescuers should be able to perform expired air resuscitation without restrictive fatigue, and (2) they should be able to exert the pressure needed to inflate the lungs, despite the occasional obstacles of bronchoconstriction and lesser compliance of the victim's thorax.

Methods

As details are presented in published reports,[1] only general procedures are described here. All "victims" in 29 controlled resuscitations were anesthetized adults given a relaxant drug in paralytic doses. After apnea was produced, the resuscitation was performed by a physician, nurse, or laboratory technician. With the onset of complete apnea resulting from administration of curare or succinylcholine (Anectine, Quelicin, Sucostrin) chloride, resuscitation was started before the patient developed cyanosis. In none of these sequences did the arterial oxygen saturation remain below 85% for more than 15 seconds, and no episodes of significant hypoxia occurred during the entire course of expired air resuscitation. Only 2 of the 11 rescuers had had previous experience with expired air resuscitation. The basic steps we have employed, both in these studies and in emergencies, are outlined as follows. A similar sequence was followed after tracheal intubation of some patients.

The steps in mouth-to-mask resuscitation in adults are shown in figure 1. They are as follows:

1. Clear mouth and throat of possible foreign bodies.
2. With patient supine, establish airway by elevating mandible with bilateral support at angles. Hold oronasal mask in place by thumbs and forefingers.
3. Take a deep breath and apply lips around hole of mask. Inflate victim's chest until you see it lift.
4. Take next deep breath while listening for victim's exhalation.
5. If airway is partially obstructed, elevate mandible until inflation is noiseless and exhalation is free, without snoring.
6. Continue the large volumes of inflation at rates of 12 to 20 per minute.
7. Interrupt inflation momentarily for decompression of stomach if necessary; moderate gastric dilatation is unimportant, but if hyperdistention occurs, apply abdominal pressure gently between inflations. Remove regurgitated fluid.

TABLE 1.—*Predictions of Expired Air Resuscitation*

	Air Ventilation, Liters/Min	Inspired Oxygen, %	Oxygen Consumption, Cc/Min	Expired Oxygen, %
Normal man	5	21	300	15
Hyperventilating rescuer	10	21	300	18
Hyperventilated victim	10	18	300	15

In most of these controlled resuscitations, the rescuers performed inflations at an increased volume over their normal breathing, subjectively estimated to be at least a twofold increase. Variations in volume and rate of inflations were specifically assessed in some studies. The most comprehensive set of simultaneous measurements involved a variant of expired air resuscitation when the mask-to-mask resuscitator was used.[11] This apparatus purposely incorporates a 300 cc. external dead space, imposed only upon the rescuer, which results in slight differences in alveolar gas concentrations as compared with other variants without interposed dead space. The effects introduced by such accessories do not significantly modify the fundamental physiological conclusions.

To assess other types of artificial respiration employing ambient air or oxygen as the ventilating gas, it is probably sufficient to measure tidal volume. However, since the composition of expired air *depends upon the rescuer's hyperventilation*, assessment of expired air resuscitation should also include measurements of oxygen and carbon dioxide concentrations in the alveolar air and in the arterial blood of the victim.

Oxygenation was studied in three ways, often simultaneously.[11] The oximeter value was observed or recorded (see fig. 2). A mass spectrometer sampled air continuously at the airway of the victim to obtain a record of the alveolar and inspired *oxygen concentrations of both the victim and his* rescuer. Arterial samples were drawn before and during expired air resuscitation for Van Slyke analysis of oxygen content and oxygen capacity.[11] Carbon dioxide exchange was recorded by sampling at the airway with a Liston-Becker analyzer to record inspired and alveolar concentrations of rescuer and victim. The arterial blood samples were also analyzed for carbon dioxide content, carbon dioxide tension, and pH (by glass electrode). A calibrated pneumotachograph record of airflow before and during expired air resuscitation was integrated to obtain tidal volume. The arrangements for recording these measurements are graphically presented elsewhere.[11]

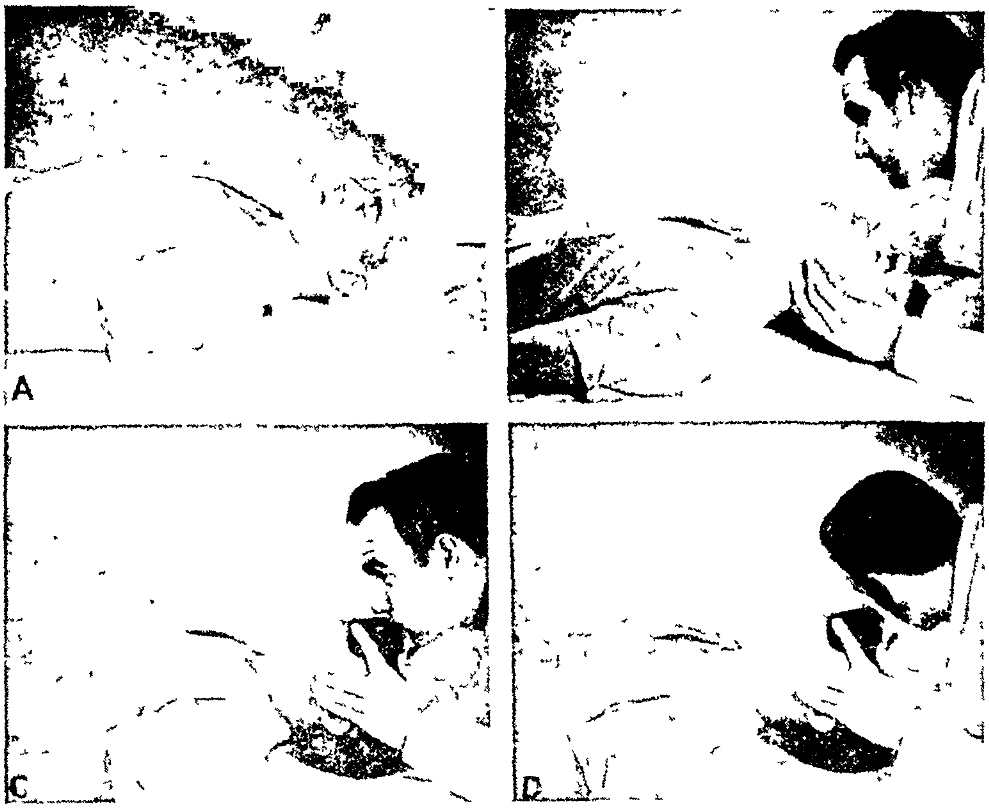

Fig. 1.—*A*, airway obstruction. Mandible recedes permitting soft parts to occlude pharynx. Any method of artificial respiration must first correct this obstruction. *B*, elevation of mandible to open airway. Bilateral upward traction at angles of mandible pulls soft tissue out of airway. *C*, mouth-to-mask inflation. Continued retraction of mandible maintains airway. Mask is pressed to face with forefingers and thumbs to minimize leakage during inflation Rescuer inflates until victim's chest expands. *D*, deflation. Rescuer inhales while listening to patient's exhalation and for sounds of secretions or regurgitation of air or fluid.

To assay energy costs, 27 volunteers (medical students, technicians, or enlisted personnel) participated in assessments of the work load incident to expired air resuscitation under adverse circumstances by ventilating a model of a "tight" bronchoconstricted chest.

In one series, the model simulated an extreme bronchoconstriction (*airflow resistance*, 15 × normal) and the spastic rigidity of a chest in tonic contraction (stiffness, 10 × normal). Records of rate, pressure, and volume of inflation by 20 volunteer rescuers were continued for an hour per trial.[18]

The physical stamina required for maintaining expired air resuscitation during the transport of the victim (by stretcher or ambulance) was studied in another series. Seven other volunteers exercised moderately on a stationary bicycle as they blew all expired air through a model, duplicating the resistance of an extremely bronchoconstricted victim. These experiments were then repeated with the addition of a 300-cc. dead space, because during transport of the victim the extension of a breathing tube between him and his rescuer makes for convenience. Alveolar concentrations were measured from a Rahn end-expiratory sampler with a Cambridge hot-wire carbon dioxide meter and a Beckman oxygen analyzer. Expired air was collected in a spirometer for analysis of oxygen and carbon dioxide concentrations. Thus the rate and volume of inflation by the rescuer and the suitability of his expired air, in terms of oxygen and carbon dioxide, to ventilate a victim were determined.

Results

Oxygen Concentrations During Expired Air Resuscitation.—The mean alveolar oxygen concentration of six patients increased from 12.3% before *resuscitation to* 16.1% during resuscitation (table 2). In every instance expired air resuscitation produced an elevation in the patient's alveolar oxygen concentration above the control. These findings confirm the prediction that by hyperventilation the rescuer provides the victim with a normal alveolar oxygen concentration. In fact, we consistently were able to elevate the patient's alveolar oxygen concentration to better than normal levels by further increases in inflation volume. Conversely, failure of the rescuer to hyperventilate, especially if leaks were present, promptly lowered the patient's alveolar oxygen concentration and the oximeter value. These findings emphasize the *importance* of large inflation volume

Arterial Oxygen Saturation.—Direct measurements of arterial oxygen content and capacity during expired air resuscitation are available from three series involving, in all, 25 subjects.[2] The mean arterial oxygen saturation during resuscitation was 93.7% (table 2). Only two values were below 90%. In one of these patients the oxygen saturation before anesthesia was only 84% and during resuscitation increased to 87%. The other patient had an oxygen saturation of 89% during resuscitation. In 14 patients saturations were determined prior to anesthesia and curarization and then during expired air resuscitation. There was no statistically significant difference in the oxygen saturations of these 14 patients before and during resuscitation.[1c] These arterial oxygen saturations, obtained 5 to 65 minutes after the start of expired air resuscitation, reinforced the conclusion drawn from earlier series[1b] that expired air resuscitation with hyperventilation produces excellent oxygenation of the victim.

Carbon Dioxide Exchange.—Alveolar carbon dioxide tensions, measured in 21 patients, were maintained by expired air resuscitation at or below 50 mm. Hg. No patient had progressing carbon dioxide accumulation. In 12 patients the mean alveolar carbon dioxide concentration was 5.6% before resuscitation and 3.9% during resuscitation (table 2). Expired air resuscitation produced a fall in alveolar carbon dioxide concentration in all 12 patients.

Arterial Carbon Dioxide and pH Changes.—The mean arterial carbon dioxide tension of 17 patients in two series of expired air resuscitations was 26.6 mm. Hg (table 2). Thus, the predicted normal carbon dioxide level during expired air resuscitation was attained and further decreased by hyperventilation. No untoward effects of this mild hypocapnia were noted. Since the highest value found was only 37 mm. Hg, there appears no validity in rejection of expired air resuscitation on the a priori supposition that it would increase the patient's carbon dioxide levels. Such increases occur only if the rescuer fails to deliver the increased volume of inflation to the patient.

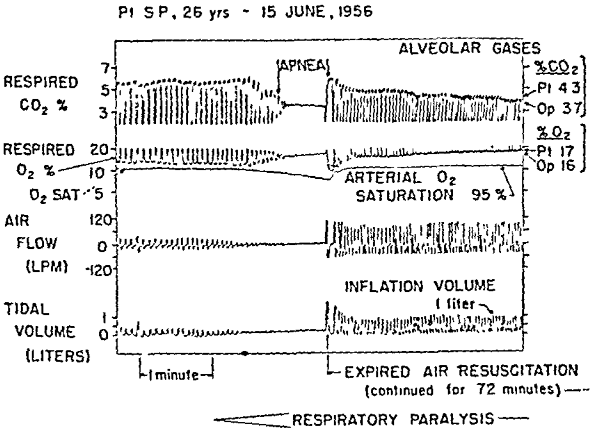

Fig. 2.—Rapidly developing asphyxia, induced by curare, is promptly reversed by artificial ventilation with rescuer's expired air. After four inflations, oxygen and carbon dioxide levels are restored to previous normal. With sustained hyperventilation by rescuer, patient's alveolar oxygen is elevated above normal and carbon dioxide concentration is decreased to a mildly alkalotic value.

TABLE 2.—*Patient's Arterial Blood and Alveolar Gas Values Before and During Expired Air Resuscitation*

	Before Resuscitation			During Resuscitation		
	Subjects, No.	Mean	Range	Subjects. No.	Mean	Range
Alveolar gas oxygen, %	6	12.3	9-15	6	16.1	15-17
Change in alveolar gas oxygen, %	...	...	...	6	3.8	1-7
Arterial blood oxygen saturation, %	14	92.4	84-96	25	93.7	87-100
Alveolar gas carbon dioxide, %	12	5.6*	4.3-6.9	12	3.9	2.7-5.1
Change in alveolar gas carbon dioxide, %	...	...	...	16	−1.0	−0.2-−2.3
Arterial blood carbon dioxide tension, mm.Hg	14	31.6†	26-35	17	26.6	18-37
Arterial blood, pH	14	7.48	7.45-7.53	14	7.54	7.43-7.65

* Recorded with Liston-Becker analyzer after anesthesia had been induced.

† Arterial samples obtained prior to anesthesia.

Arterial pH determinations in the early series included only four measurements during resuscitation but no control values. Values as low as 7.31 were found.[1b] Later, arterial pH was determined both before and during resuscitation in 14 patients.[1c] With greater emphasis upon hyperventilation, the mean values were elevated from 7.48 to 7.54 by expired air resuscitation (table 2). These findings, which support and confirm the carbon dioxide measurements, demonstrated that by expired air resuscitation one can effect carbon dioxide elimination from the victim beyond marginal requirements.

Rapidity of Resuscitation.—The foregoing information on oxygen and carbon dioxide exchange pertains to relatively steady states attained during expired air resuscitation. Equally significant is the rate of reversal of the asphyxial state. The rapidity with which the victim can be reoxygenated was analyzed in 13 patients (table 3).

Figure 3 depicts the oxygen and carbon dioxide measurements in a single case. Quite comparable performances were documented in five other patients. In figure 3 the initial record, marked "spontaneous respiration," refers to the control period while the patient breathed room air after premedication and induction of general anesthesia. The tidal volume was 700 cc., arterial oxygen saturation by Van Slyke analysis 95%, alveolar oxygen concentration 13%, and alveolar carbon dioxide concentration 7.5%. During the interval marked "paralysis," succinylcholine chloride was given by continuous intravenous drip. With the onset of apnea, alveolar gases did not reach the upper airway to be measured (broken lines). The effects of apnea on these concentrations, however, are noted after the first inflation with the rescuer's expired air. Within five seconds the oximeter value begins an abrupt rise. During resuscitation, the rescuer's expired air (17.5% oxygen concentration and 3.5% carbon dioxide) becomes the inspired air of the patient. During expired air resuscitation the large tidal volumes of about 2 liters maintained the patient's arterial oxygen saturation at 96% (Van Slyke analysis).

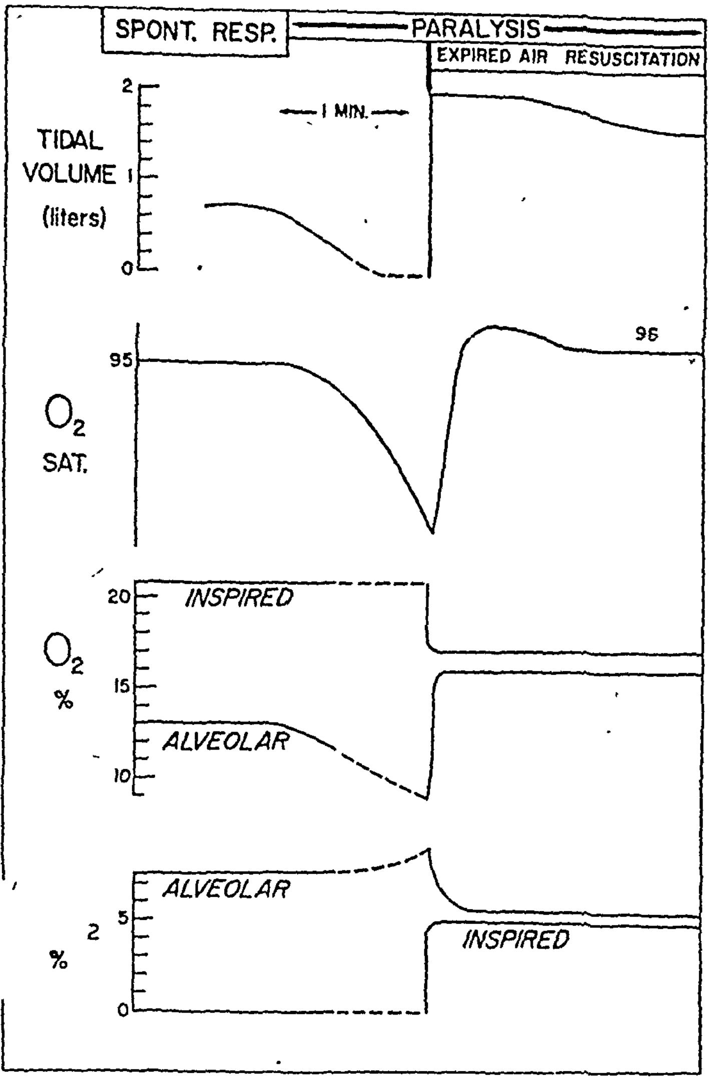

Fig. 3.—Oxygen and carbon dioxide measurements in one patient.

Restoring the victim's pulmonary oxygen concentration to normal requires only 5 to 20 seconds (table 3). This elevation involves four to five inflations (fig. 2), and therefore its rate depends upon how rapidly the rescuer executes these first inflations.

Reoxygenation of arterial blood depends on the circulatory state. Restoration of the arterial oxygen saturations to the control value, as evidenced by the oximeter, frequently required no more than 15 seconds. In some patients, the oximeter approached the control value rapidly and then increased more gradually, requiring as long as three and two-fifths minutes to reach the control level. However, adequate values (above 90%) were attained consistently within one minute in these patients.

Similar considerations apply to the interval required for the alveolar carbon dioxide concentr tion to return to the control level (table 3). Th rapidly developing respiratory acidosis resultir from apnea is promptly reversed by vigoro hyperventilation.

Effect of Imposed Rates upon Inflation Volun and Alveolar Gas Exchange.—Several experimen in which the mask-to-mask resuscitator was use explored the effect of respiratory rate.[3] In succe sive trials the rescuer set his rate of inflations 6, 12, and 24 per minute. The rebreathing of pa of his own expired air caused the rescuer to r flexly increase his ventilation. The resulting inflati volumes and alveolar gas concentrations of t victim are summarized in table 4. With threefo to sixfold increases in tidal volume over the restin level, average alveolar oxygen concentration w maintained 3% above control, whereas dioxide concentrations remained in the hypocap range.

It is clear from these experiments that the of inflations may vary widely without adver affecting the oxygenation of the victim. This is provided the volume of inflation is maintained liter or more. Thus, in considering simpler v of expired air resuscitation, in which the effects of the external dead space are not invo it is important that the rescuer voluntarily incr the volume of inflation by deeper bre hypocapneic symptoms appear in the resc the result of excessive hyperventilation, he reduce his ventilation somewhat. However, as as he sees the victim's chest lift, gas exchang be adequate.

The recommendation for expired air resus of adults by any of the several variants include a volume of at least 1,000 cc. (or i until chest is observed to rise), a rate of 1 inflations per minute, and sufficient pressu

Energy Cost of Performing Expired Air I tation.—The well-known pressure-volume ch istics of the normal human lung and thorax i

Table 3.—*Speed of Reoxygenation and Reversal o Dioxide Accumulation During Expired Air Resusc*

	Subjects, No.	Me Se
Return of arterial oxygen saturation to control value (oximeter)	13	6
Return of alveolar oxygen to control concentration	6	1
Return of alveolar carbon dioxide to control concentration	16	

that an individual could perform the breathing for himself and a passive victim indefinite period. Among the patients measurements are reviewed here, there quently performances by a single rescuer hour. In an effort to see whether operator or hypocapnia would become limiting

was performed continuously on one
our hours by one operator. Oximeter
cated 95 to 100% arterial oxygen satura-
s paralyzed patient. However, the ques-
formance when the patient is not ideally
eded to be answered. Measurements dur-
ed air resuscitation in patients with
-way resistance or reduced chest com-
not clinically feasible. Therefore a
s devised to simulate the victim with
truction. This model had an airway
; times normal and a compliance one-
nal. Twenty untrained volunteers were
ntilate this "bronchoconstricted" system
ur.[18] The average inflation was 741 cc.
o 1,160 cc.) and the average rates 10
Leakage at the face of the model during
ccounted for relatively poor performances
the 20 rescuers. These three rescuers
minute ventilations of 2.6, 3.1, and 3.4
hereas the range for the remaining 17
was 4.3 to 13.9 liters. None of the volun-
erienced significant chest fatigue. The ob-
this test were far beyond those which
encountered in actual resuscitation, since
orceful inflations of the lungs usually re-
resistance and compliance to near normal

results suggested that the rescuer might
ticipate in the transport of a victim while
; for him through an endotracheal tube,
rcumstances require it. To test this possi-
ider unfavorable circumstances, seven
were asked to exercise while ventilating
ioconstricted" model with a mask-to-mask
r a period of three-fourths hour to one
of the seven were able to perform re-
n under these circumstances. Oxygen
ion and energy cost were increased three-
xercise and fivefold by combined resusci-
nd exercise (table 5). The rescuers
ed normal expired concentrations of oxygen

.—*Effect of Rate of Ventilation During Expired Air Resuscitation*

Tidal Volume, Liters	Alveolar Oxygen, %	Alveolar Carbon Dioxide, %
0.4	14	6.5
2.3	17	4.5
1.5	17	4.2
1.1	17	4.5

ous breathing prior to paralysis and artificial respiration.

on dioxide. With the mask-to-mask device,
0 cc. of air containing 21% oxygen en-
e first fraction of expired air delivered to
n on each inflation. Thus, the requirements
tim were easily met. The rescuer who was
complete resuscitation with the mask-to-
ice was able to ventilate the "bronchocon-
model, while exercising, by changing to
the mouth-to-mask method. Thus, ventilation can be provided by this method while patients are being transported, provided a patent airway is maintained.

TABLE 5.—*Effect of Exercise by Rescuer During Simulated Resuscitation*

Conditions of Simulated Resuscitation	Oxygen Consumption, Cc./Min.	Tidal Volume, Liters	Expired Oxygen, %	Expired Carbon Dioxide, %	Minute Volume, Liters	Energy Cost, Cal./Min.*
Before resuscitation	273	0.74	16.68	3.59	7.4	1.32
Exercise during resuscitation†	871	1.56	15.96	4.49	20.4	4.21
Exercise while ventilating "bronchoconstricted" model‡	1,258	2.75	15.96	4.33	27.9	6.08

* *Calculated at 4.8 calories per liter of oxygen.*

† 280 Kg.-meters per minute, equivalent to climbing 60 flights of stairs per hour.

‡ Resistance: 20 cm. of water per liter per second at 1 liter per second flow.

Rescuers naturally adjust to the specific tasks of expired air resuscitation very promptly. Although untrained rescuers begin with an inefficient breathing pattern, their performance rapidly improves. Their adjustments are apparent from records of pressure and volume during simulated resuscitation of chest models of varying resistance and compliance. Having been instructed to inflate either a patient's chest or a model to a visual end-volume, rescuers find, within a few inflations, the breathing pattern which requires the least effort. They learn not to maintain pressure at the end of the inflation since both errors waste muscular effort. When changes in resistance and compliance occur, rescuers automatically readjust the breathing pattern to the most efficient combination of flow rate, frequency, and tidal volume. One can sense immediately the onset of airway obstruction, the accumulation of secretions, and the recurrence of spontaneous breathing. By their natural adjustments, trained rescuers tend to limit the volume and minimize the pressure delivered to the victim, reactions which avoid excessive inflation of the lungs and stomach and which reduce circulatory embarrassment due to positive intrapulmonary pressure.

During the five-year period that these methods have been studied, occasions necessitating the emergency use of expired air resuscitation have been encountered. Most frequently the method was used in the patient's hospital room where special resuscitating apparatus was not immediately available or in the corridors or the elevator while a patient was being transported on a hospital cart or wheel chair. Other situations in which it might be needed are in the home, at the beach, in the medical or dental office, in ambulances, and at public gatherings where special apparatus is not immediately available or functioning. Although no method of resuscitation is universally successful, expired air resuscitation has succeeded when other methods, including manual, have failed. In our hospitals, mouth-to-mouth or mouth-to-mask resuscitation has been successful in at least 12 emergency situations. When expired air resuscitation was started in time, adequate oxygenation and recovery resulted. Thus, expired air resuscitation should be employed immediately and during the interval before special resuscitation equipment can be readied and applied. Rapid reoxygenation may prevent cardiac arrest and thereby insure recovery.

Conclusions

Extensive physiological measurements in 29 adult anesthetized patients demonstrate expired air resuscitation to be an efficient, versatile method of artificial respiration. Reoxygenation of the patient's lungs is possible with four inflations, and within a circulation time arterial oxygen saturation can be restored to normal. Carbon dioxide levels are concomitantly reduced. The data reported here refute the widespread prejudice that a rescuer's exhaled air contains too little oxygen and too much carbon dioxide. By mild hyperventilation the rescuer readily converts his exhaled air to a suitable resuscitating gas. He can perform the method for prolonged periods without undue fatigue or hypocapneic symptoms.

Unlike manual methods, mouth-to-mouth techniques station the rescuer at the victim's airway with several consequent advantages. 1. If the airway becomes obstructed, the rescuer senses resistance. 2. If secretions accumulate, he feels and hears gurgling. 3. He is able to see whether the chest expands during inflation. 4. He can feel the return of spontaneous breathing. 5. He has both hands available for airway toilet and for sustained support of the jaw.

Experience with mouth-to-mouth techniques and its variants in emergency resuscitation of hospital patients and physiological measurements made under controlled conditions indicate that two important precepts must be followed. 1. A patent airway must be promptly established and maintained. 2. Inflation volumes of a liter or more must be delivered to the adult victim's lungs at a rate of 12 to 20 per minute.

Drs. John D. Elder Jr., Robert O. Bauer, and Clinton D. Janney conducted various measurements summarized in this report.

These studies were supported, in part, by funds provided under contracts with the Division of Research and Development, Office of the Surgeon General, Department of the Army, and by a grant from the Dent Family Foundation

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3. Reference 1*c* and *f*.

GENITOURINARY TUBERCULOSIS.—*Genitourinary tuberculosis* is a frequent extrapulmonary site of tuberculosis infection. Mycobacterium tuberculosis may be disseminated via the blood stream from a primary extragenital focus and trapped by the richly vascular kidneys. Secondary foci of infection may then spread in a retrograde fashion to the genital organ. Tuberculous infection of the renal and genital organs of the female occurs by the hematogenous route. Before and after the chemotherapeutic era and up to 1956, surgical resection was instrumental in all forms of treatment of genitourinary tuberculosis except minimal lesions. Present-day experience indicates that the pendulum may be swinging away from radical surgical excision. Two years of triple drug therapy (streptomycin sulfate, isoniazid, and para-aminosalicylic acid) without surgical intervention, are advocated for most genitourinary tuberculous lesions that show a response to therapy. Many patients with far-advanced lesions may do better than previously suspected on long-term drug therapy alone. Operative procedures should be reserved for those with the more advanced stages of the disease and based upon individual case circumstances.—Lieut. Col. S. J. Berte (MC), U. S. Army, Genitourinary Tuberculosis, *United States Armed Forces Medical Journal,* July, 1957.

VENTILATORY EFFICACY OF MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION

IRWAY OBSTRUCTION DURING MANUAL AND MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION

Peter Safar, M.D., Baltimore

There are misconceptions in the present thinking about emergency artificial respiration because not enough attention is paid to the behavior of the airway above the larynx. Therefore, this report will present data on airway obstruction with the mouth-to-mouth and chest-pressure arm-lift methods, a recommendation of two techniques of mouth-to-mouth artificial respiration without equipment, and data on pulmonary ventilation produced by the mouth-to-mouth method.

Experimental Methods

The mouth-to-mouth method and the chest pressure arm-lift methods were studied and compared during 27 controlled experiments in which an endotracheal tube was not used. One hundred and sixty-seven untrained rescuers (62 firefighters, 6 policemen, 4 soldiers, 16 Red Cross workers, 23 doctors, 8 nurses, 36 medical students, 6 housewives, and 6 Boy Scouts) performed the mouth-to-mouth methods, and 18 trained rescuers performed the chest-pressure arm-lift methods The "victims" were 15 patients and 10 volunteers. The patients were anesthetized and curarized apneic adults. The volunteers, including four physicians, five medical students, and one nurse, were healthy young adults who weighed between 101 and 210 lb. (45.8 to 95.4 kg.). They were placed on a three-inch foam rubber mattress on a stone floor and rendered unconscious by administration of scopolamine and meperidine (Demerol) hydrochloride. Each was kept apneic for one to three hours by a continuous intravenous drip of succinylcholine (Anectine, Quelicin, Sucostrin) chloride. Hyperventilation with 50% oxygen and 50% nitrous oxide was interrupted at intervals for the study of the different methods of artificial respiration. Denitrogenation of the victim's lungs and avoidance of apnea for more than 90 seconds prevented hypoxia.

During performance of the mouth-to-mouth methods, the respiratory tidal volumes and rates were recorded by a tambour inkwriter from a volumetrically calibrated pneumograph, which was placed over the victim's chest and upper abdomen. During performance of the chest-pressure arm-lift methods, measurements were made by connecting to a recording spirometer a tight-fitting face mask, which did not interfere with the natural position of the victim's head. In four experiments the victim's relative arterial oxygen saturation of hemoglobin was recorded from an ear oximeter, and the end-expiratory air carbon dioxide concentration of both the victim and the rescuer was recorded from an infrared carbon dioxide analyzer.

Tracheal pressures were measured in two subjects by a strain gauge. The amount of air forced into the stomach by the mouth-to-mouth methods and the lung-chest distensibility of all victims were measured at intervals.

Several rescuers each performed a variety of mouth-to-mouth techniques, the spirograms of which permitted an objective comparison of technical details. A total of over 10 hours of pneumograph tracings of mouth-to-mouth breathing was obtained during these experiments.

Airway Obstruction

Shape of the lips, teeth, mandible, and tongue, the body type, and the depth of anesthesia or coma all influence the degree and incidence of airway obstruction. For instance, the pharynx of unconscious obese patients seems to become more readily obstructed than the pharynx of lean patients. The belief that the prone position opens the airway is erroneous since we found airway obstruction to be as frequent with the patient in the prone position as in the supine position. These observations are based on preliminary results of a current study on the behavior of the upper airway conducted by Safar, Chang, and Escarraga.

The pharynx of every anesthetized or comatose patient becomes obstructed when the head is flexed, in the supine as well as in the prone position, whether or not an artificial oropharyngeal airway is used. Extension of the head at the atlanto-occipital joint (sniffing position) opens the pharynx in one-half to two-thirds of these patients. In addition to the extension of the head, the remaining patients require either the insertion of an oropharyngeal airway or forward displacement of the mandible, which is best accomplished by the maneuvers shown in figure 1*B* or 1*D*. Some patients require all three steps, extension of the head, insertion of an oropharyngeal airway, and forward displacement of the mandible, but the most important is extension of the head.

Figure 2 indicates clearly that the position of the head and the jaw may make the difference between the failure or the success of any method of artificial respiration. The rescuer's hands are needed for this crucial support of the head and jaw (fig.

From the Department of Anesthesiology, Baltimore City Hospitals.

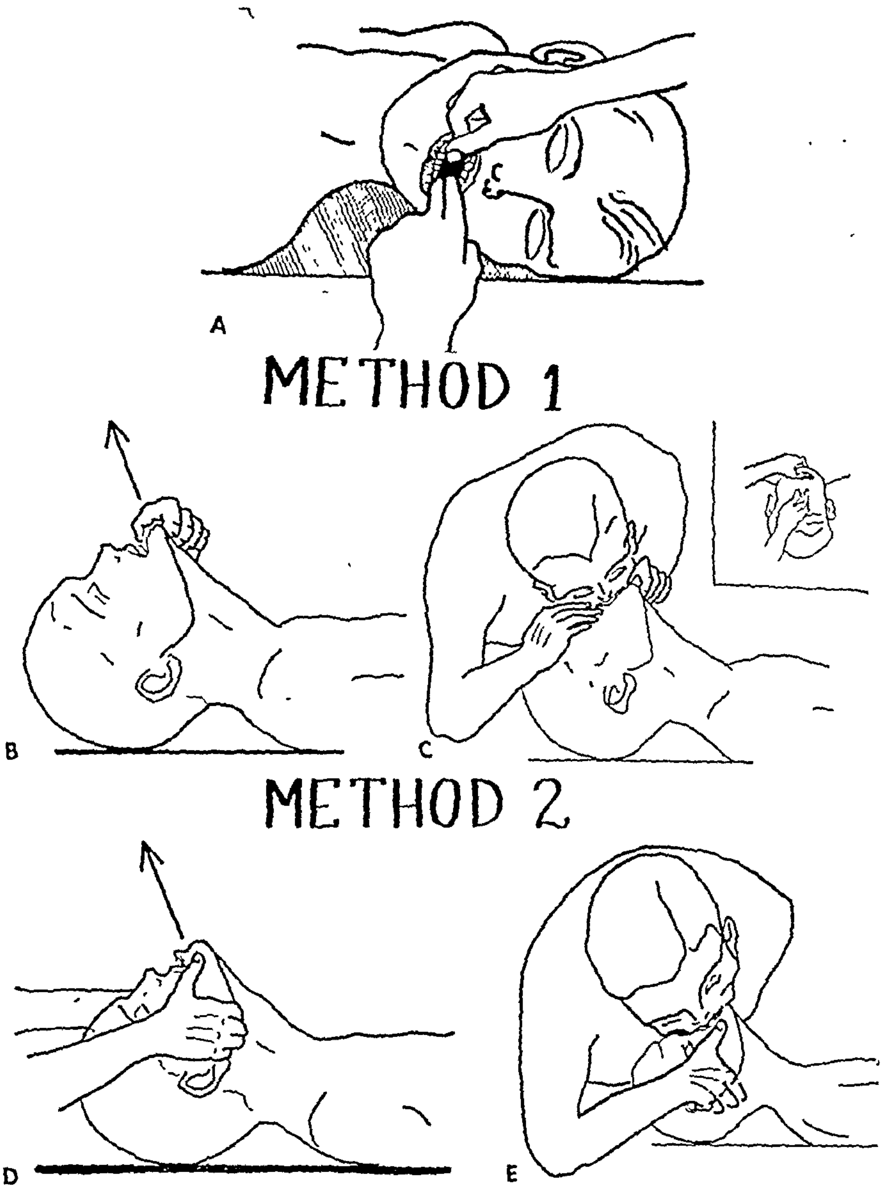

Fig. 1.—When victim is found, place him supine and kneel close to his left ear. *A*, if foreign material is visible at the mouth, turn victim's head to the side and quickly clean mouth and throat with your fingers or a piece of cloth. This should take only a few seconds. If the mouth appears clean, start mouth-to-mouth breathing immediately. Repeat cleaning procedure during mouth-to-mouth breathing whenever necessary. *B*, support of upper airway, method 1. Extend victim's head, insert your left thumb (which may be wrapped for protection) between his teeth, grasp mandible at midline, and hold it forcefully forward (upward), so that lower teeth are leading. *C*, mouth-to-mouth breathing, method 1 (for adults and large children). Maintain support of upper airway as described in *B*. Close victim's nose with your right hand. Take a deep breath, place your mouth firmly over victim's mouth, and blow forcefully in adults and gently in children. Watch victim's chest, and when it rises, take your mouth off victim's mouth and let him exhale passively by the elastic recoil of his lungs and chest. Repeat inflations about 20 times per minute. *D*, support of upper airway, method 2. Extend victim's head, grasp with both hands the ascending rami of mandible just beneath ear lobes, and hold mandible forcefully forward (upward), so that lower teeth are leading. Prevent lip obstruction by retracting victim's lower lip with your thumbs, but never flex victim's head. *E*, mouth-to-mouth breathing, method 2 (for children below 3 years of age and for adults whose mouths cannot be opened). Maintain support of upper airway as described in *D*. Take a deep breath, place your mouth firmly over victim's mouth(in an infant cover both his mouth and nose with your mouth) and blow. Cover nose of an adult victim with your right cheek to prevent air leakage. Blow forcefully in adults, gently in children, and use only puffs from the cheeks in newborn babies. When you see victim's chest rise, take your mouth off victim's mouth and let him exhale passively. Repeat inflations about 20 times per minute.

1*B* and 1*D*), and the mouth-to-mouth method permits both hands to be available for this task. This is not the case with the chest-pressure arm-lift methods.

In our experiments, trained rescuers using the currently recommended back-pressure arm-lift method (Holger Nielsen) were unable to ventilate the lungs of 11 of 15 victims because of airway obstruction (fig. 2). In the unsuccessfully ventilated adults, who were rather obese, less than dead space air was moved with all breaths. In the other four victims, who were rather lean, tidal volumes between zero and 780 ml. were moved with the back-pressure arm-lift method. The arm-lift maneuver tends to flex the head, causing obstruction of the pharynx. Therefore the tidal volume may progressively diminish (fig. 3). This phenomenon occurred in 9 of 15 victims. Furthermore, figure 4 demonstrates a valve-like behavior of the pharynx, which was observed with the back-pressure arm-lift method in 10 of 15 victims. We call it a "valve-effect" because, while the back-pressure expels some air, the succeeding arm-lift maneuver meets partial or complete inspiratory obstruction. We explain this phenomenon as follows. Expelling air from the lungs into the pharynx (positive pressure) tends to push the pharyngeal walls apart, whereas sucking air into the lungs from the pharynx (negative pressure) tends to collapse the pharyngeal cavity. An air passage may be obstructed in the presence of a low-pressure gradient but open in the presence of a high-pressure gradient. Anesthetists who are acquainted with this fact commonly use positive manual pressure on the breathing bag to correct airway obstruction.

During performance of the back-pressure arm-lift method in five subjects, we prevented the commonly occurring pharyngeal obstruction with an endotracheal tube. In all five, we moved tidal volumes of 260 to 840 ml. through the tube while no exchange greater than estimated dead space air occurred without the tube in four of the five victims. In one victim, a small lean woman, we moved 600 ml. per tidal volume without the tube.

With the chest-pressure arm-lift method (Silvester), we likewise found inadequate ventilation in 70 to 80% of the victims because of pharyngeal obstruction.[1a]

Techniques of Mouth-to-Mouth Artificial Respiration

We studied seven different methods of mouth-to-mouth artificial respiration which did not involve equipment. Untrained laymen (see table) produced the greatest pulmonary ventilation with methods 1 and 2, which are pictured and described in figure 1. After having watched one demonstration, untrained rescuers were asked to ventilate the victim's lungs as well as possible. Those who could position the victim and could produce more than two breaths, each over 500 ml. during the initial 60-second period, were considered successful. Ninety per cent of the 145 rescuers who performed method 1 were successful. Eighty-nine per cent of the 90 rescuers who performed method 2 were successful. Of the 82 rescuers who performed both methods, 94% were successful with method 1, and 87% were successful with method 2. With method 1 as compared with method 2, half as many rescuers required over 10 seconds to produce the first breath of more than 500 ml. We asked 63 rescuers who performed both methods which one they preferred; 90% favored method 1.

Although we recommend method 1 over method 2 on the basis of the preceding figures, method 1 cannot be used satisfactorily in a victim whose mouth cannot be opened and in a child less than 3 years of age, in whom the rescuer's thumb interferes with the mouth-to-mouth contact. Method 2 is recommended for such victims. We, therefore, suggest that both methods be taught.

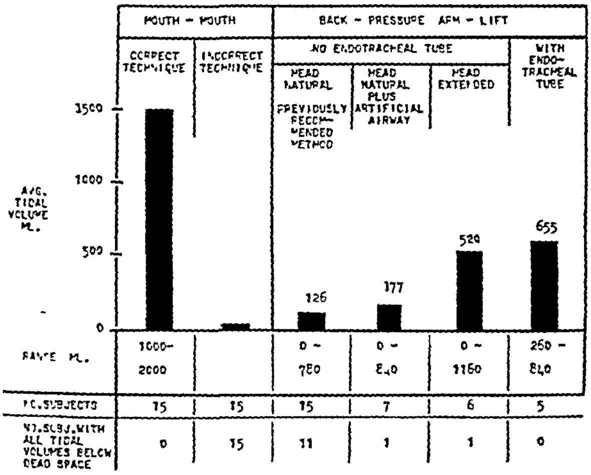

Fig. 2.—Tidal volumes as influenced by upper airway obstruction.

The following five methods were found to be less satisfactory than methods 1 and 2.

1. The rescuer closed the victim's nose with his right hand and supported the right angle of the jaw with his left hand. Support of the angle of the mandible by one hand was found to be insufficient for the maintenance of a patent airway.

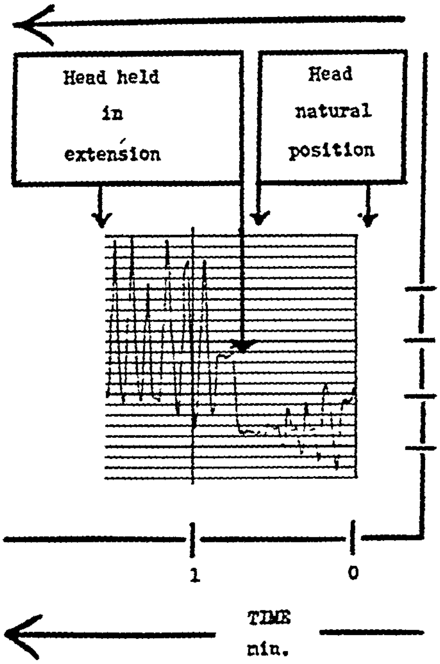

Fig. 3.—Failure of back-pressure arm-lift method due to partial airway obstruction. Progressive flexion of head leads to progressive reduction of tidal volume. (Follow tracing from right to left.)

2. The rescuer supported with both hands both angles of the victim's jaw and occluded the nose with both thumbs. This method did not prevent obstruction by the victim's lips.

3. The rescuer opened the victim's mouth by pressing from the outside against his cheeks. In this case, the location of the area on which pressure could be successfully applied proved difficult.

4. For aesthetic reasons, the rescuer interposed his thumb and index finger in the form of a ring between the victim's lips and his own lips. Air leakage and obstruction by the victim's lips occurred with this method.

5. Mouth-to-nose artificial respiration failed in about 50% of the victims because of complete or partial occlusion of the nasal passages (see table). Often the nasal passage was open at the beginning of the experiment but became obstructed by mucus later on. We tested the nasal patency of 100 healthy, conscious persons and found partial or complete obstruction of one or both nasal passages in 25%.

Gastric distention occurred during mouth-to-mouth breathing when the jaw was not properly supported or when the rescuers used excessively high inflation pressures. It was always a harmless and preventable complication. Even when the epigastric area protruded, we never measured more than 1,000 to 1,900 ml. of air in the stomach. Apparently, once the air was under a certain pressure in the stomach, more was prevented from entering. Occasionally such amounts were found after only a few breaths of incorrect mouth-to-mouth breathing; at other times, no air was found after more than 15 minutes of correct mouth-to-mouth breathing. Generally, less gas was blown into the stomach of lean victims than into the stomach of obese victims, since a patent airway was more easily maintained, thus requiring less inflation pressure in the former.

When the epigastric area protruded, most of the air could always be expelled by manual pressure over the stomach between breaths. During resuscitation in the field this maneuver may expel gastric contents too, in which case the rescuer must be ready to clean the pharynx at once. Whenever gastric distention occurred, we saw no significant changes of the victim's blood pressure or pulse rate, and we were always able to continue adequate pulmonary ventilation. Therefore, mantaining manual pressure over the epigastrium during mouth-to-mouth breathing is not necessary in adults, according to our figures, and is also undesirable because both of the rescuer's hands are needed at the victim's head. Although our experience with children, which is limited to actual field resuscitations, indicates that sometimes the jaw can be supported with one hand, I prefer the use of both hands at the child's head.

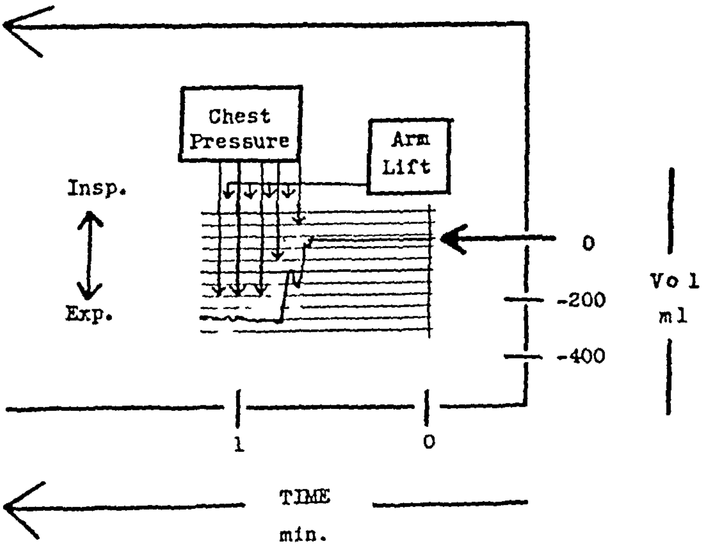

Fig. 4.—Failure of back-pressure arm-lift method due to complete inspiratory obstruction of upper airway. (Follow tracing from right to left.)

Mouth-to-mouth artificial respiration has been used for centuries for infants but has been used rarely for adults, probably because of the hesitancy of many people to "kiss" a moribund stranger. The aesthetic acceptability of this method could not be evaluated critically during our studies because the victims were clean and healthy, which did not simulate field conditions, and, furthermore, the performance had the atmosphere of competition. Only 3 medical students of the 164 rescuers refused to perform, stating that they would do it only in an emergency. None of the laymen refused.

Performance of 167 Rescuers

	Method	Rescuers Studied, No.	Rescuers Successful in Producing Tidal Volumes Above 50 Ml. Each Within 60 Sec., No.
Untrained *rescuers*	Mouth-to-mouth	164	146 (89%)
	Method 1	145*	131*(90%)
	Method 2	90	80 (89%)
	Mouth-to-airway	87	87 (100%)
	Mouth-to-nose	20	10 (50%)
Trained rescuers	Back-pressure arm-lift (Holger Nielsen)	14	2 (14%)
	Back-pressure arm-lift† (Holger Nielsen)	18	7 (39%)
	Chest-pressure arm-lift (Silvester)	13	4 (31%)
	Chest-pressure arm-lift† (Silvester)	12	6 (50%)

* The tidal exchange was measured in all instances except during the performance of 31 rescuers, with the mouth-to-mouth procedure, method 1, when it was only estimated.

† With artificial oropharyngeal airway.

Blowing into the victim's mouth through an artificial oropharyngeal airway was much more acceptable to the rescuers than blowing directly into the mouth of the victim. Therefore, mouth-to-airway artificial respiration was recommended (fig. 5) in which a self-made modification of the conventional oropharyngeal airway is used.[1] A mouthpiece for the rescuer was provided by fusing a No. 4 and a No. 3 rubber airway (for pediatrician's use, a No. 2 and No. 0 airway), which formed an S-shaped, pocket-sized instrument. The mouth-to-airway technique, which is described in detail elsewhere,[1] is more aesthetic, easier to perform, produces less gastric distention, and results in better pulmonary ventilation than direct mouth-to-mouth breathing.

Pulmonary Ventilation Produced by Mouth-to-Mouth Artificial Respiration

The tidal exchange produced by the mouth-to-mouth method depended mainly upon (1) the rescuer's skill in properly supporting the victim's jaw and in successfully preventing air leakage (fig. 2 and 6, table), (2) the rescuer's vital capacity and strength, and (3) the victim's lung-chest distensibility and airway patency.

Inadequate pulmonary ventilation with method 1 resulted from one or more of the following errors: (1) inadequate force of blowing, (2) obstruction of the pharynx whenever the rescuer pulled the mandible downward instead of upward, thus flexing the head, (3) air leakage whenever the rescuer opened the victim's mouth so wide that he was unable to cover the entire mouth of the victim with his own lips, and (4) air leakage whenever the rescuer forgot to occlude the victim's nose.

Inadequate pulmonary ventilation with method 2 resulted from one or more of the following errors: (1) inadequate force of blowing, (2) improper support of the mandible, since laymen apparently have difficulty in finding the angles of the jaw and underestimate the force necessary to lift the jaw, (3) obstruction of the airway by the victim's lips, (4) flexion of the victim's head when his lower lip was retracted, and (5) air leakage through the victim's nose, resulting from inadequate nose-cheek contact.

When the mouth-to-mouth technique was correctly performed, tidal volumes well above 1,500 ml. were moved in all victims of this study. Skillful untrained laymen were able to maintain respiratory rates of 12 to 20 per minute with tidal volumes of 1,000 to 2,000 ml. for periods up to 30 minutes without becoming dizzy. However, their hands became fatigued from supporting the victim's jaw during a long performance, and their positioning on the floor was sometimes uncomfortable.

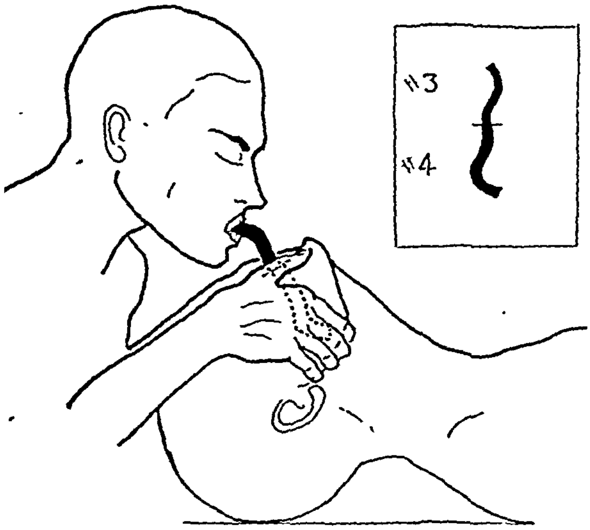

Fig. 5.—*Mouth-to-airway artificial respiration.* Insert airway along curve of tongue, without pushing tongue back. Extend head. Prevent air leakage through corners of mouth and nostrils.

Deliberate maximal hyperventilation up to two minutes' duration resulted in respiratory rates of 50 per minute, an alveolar ventilation of over 50 liters per minute, and dizziness of the rescuer after 30 to 60 seconds. Alveolar carbon dioxide concentrations of the rescuer (end-expiratory carbon dioxide in the alveolar air) between 2 and 3% were measured at the moment when dizziness started. No dizziness of the rescuers occurred with alveolar carbon dioxide concentrations above 3%. During 30 minutes of uninterrupted mouth-to-mouth breathing at a rate of 12 breaths per minute with tidal volumes between 1,000 and 1,500 ml., the victim's alveolar carbon dioxide concentration remained below normal (between 4 and 5%), and his arterial oxygen saturation of hemoglobin remained between 97 and 100%. At the same time, the rescuer's alveolar carbon dioxide concentration was between 3 and 4%. At respiratory rates as slow as 6 per minute, only skilled rescuers who were able to produce tidal volumes above 1,500 ml. were able to maintain the victim's arterial oxygen saturations and alveolar carbon dioxide concentrations within normal limits.

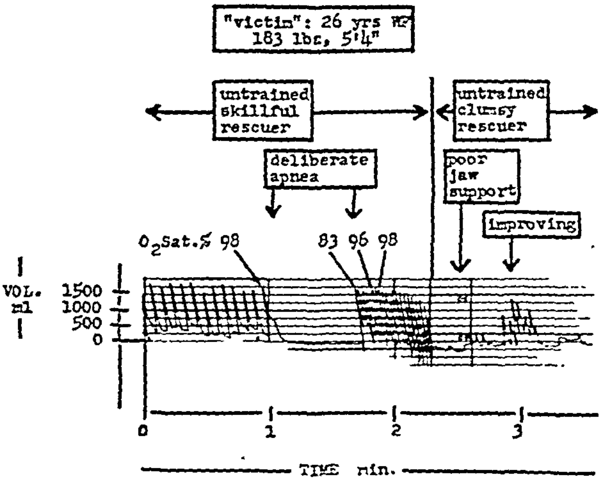

Fig. 6.—Pneumograph tracing during mouth-to-mouth breathing. (Follow tracing from left to right.)

When the victim was deliberately not ventilated (fig. 6), the arterial oxygen saturation dropped rapidly to 83 to 88% within 40 to 90 seconds, and mild hypercapnia occurred. At that point, five to nine rapid and deep inflations by the mouth-to-mouth method restored the victim's arterial oxygen saturation within a few seconds to 97 to 100% and caused his alveolar carbon dioxide concentration to drop below the control level. Figure 6 demonstrates how rapidly anoxia develops during apnea and indicates the need for immediate hyperventilation when the apneic victim is found, in order to return to normal as quickly as possible the low oxygen tension and the high carbon dioxide tension of the victim's blood before his heart stops. Hyperventilation of an unconscious person is not harmful; hypoventilation is.[2]

The expired air with the lowest concentration of carbon dioxide was delivered into the victim's lungs if the rescuer inhaled rapidly and deeply immediately before he blew. We measured carbon dioxide concentrations below 0.5% in the "head" of the air column which was moving into the victim when this technique was observed. Therefore, the rescuer should not inhale air that is to be delivered to the victim until just before he is ready to blow into the victim's mouth.

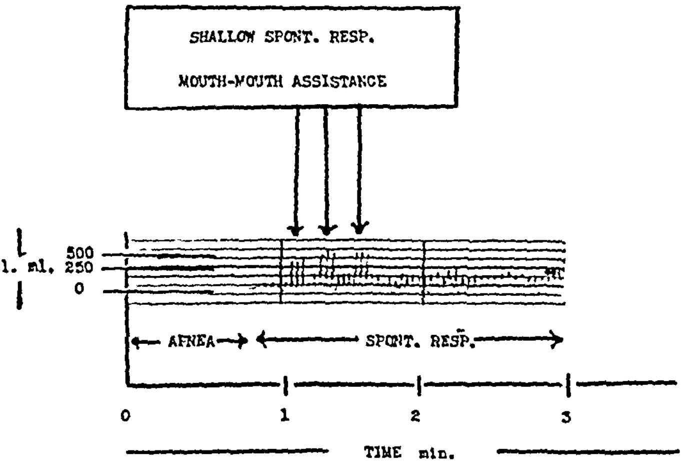

Fig. 7.—Assistance of shallow spontaneous respirations by mouth-to-mouth breathing. (Follow pneumograph tracing from left to right.) Patient was aged 9 and weighed 76 lb. (34.5 kg.); anesthetic was cyclopropane.

Our data on gas exchange with mouth-to-mouth and mouth-to-airway breathing confirm those of Elam and associates[3] obtained in 1954, with mouth-to-mask and mouth-to-endotracheal tube breathing.

Shallow spontaneous respirations were augmented by the mouth-to-mouth method (fig. 7). The rescuer blew brief but large "puffs" into the victim's mouth immediately after the onset of each inspiration of the victim. The "puffs" must be timed correctly and the mouth taken off rapidly so as not to interfere with the victim's spontaneous expiration.

The pressure necessary to move a given volume of air into the apneic victim's lungs varied with the victim's lung-chest distensibility (compliance) and airway resistance. The pressures necessary to maintain the victims' lungs inflated with 1,000 ml. of air (compliance) ranged from 13 to 26 cm. H_2O. The motion of air through a partially obstructe airway (resistance) obviously requires a high pressure at the mouth in order to move the sam amount of air. If the inflation is short, this high pressure is not transmitted to the alveoli. For i stance, in a very obese victim a pressure of 26 cr H_2O was necessary to maintain the inflation of t lungs with 1,000 ml., but a peak pressure of 29 cr H_2O was measured in the trachea during t mouth-to-mouth inflation of the 1,000 ml. The mea tracheal pressure for one such respiratory cycl with the 1,000 ml. tidal exchange and at a rate 12 per minute, was only 3.1 cm. H_2O. This rel tively low mean pressure in the trachea was d to the rapid drop of the pressure to zero wh the rescuer removed his mouth from the victim mouth. A more rapid rate of breathing or expir tory obstruction produced a higher mean pressur

Infants' and children's lungs may rupture duri mouth-to-mouth breathing if they are distend with too great a volume, the peak pressures at t mouth being irrelevant. Rupture of the lungs prevented by constantly observing the child's che which permits proper gauging of the inflations. I newborn babies the volume of inflation can l limited by the rescuer "puffing" air from only h cheeks (which air we measured to be appro mately 50 ml.) rather than blowing air from h lungs.

Actual victims in the field often have a great airway resistance and lower lung-chest distens bility than curarized volunteers because of mucu blood, or water in the air-passages, disease of t lungs and chest wall, or muscle spasm. Also t lungs of obese victims are harder to inflate tha those of lean victims because more weight mu be lifted. Nims and associates[4] and Waters an Bennett[5] could move only 140 to 280 ml. per breat in such "stiff" or obese apneic patients with t chest-pressure arm-lift methods and the use of a endotracheal tube, whereas Gordon and associates[6] could move approximately 1,000 ml. per breath in healthy, curarized "nonstiff" volunteers using the same techniques. A method, which would be effective in the field, therefore, must move, in curarized healthy subjects, tidal volumes far above those which are considered adequate. Intermittent positive pressure methods, such as mouth-to-mouth breathing, seem to be able to accomplish this.

Conclusions

The behavior of the human airway above the larynx is a complex problem and deserves more attention. Our studies demonstrate that the problem of upper airway obstruction must be taken into account in any consideration of artificial respiration. We have shown that the presently recommended back-pressure arm-lift method, when used without an endotracheal tube, frequently fails because of upper airway obstruction. On the other hand, excellent pulmonary ventilation is obtained by mouth-to-mouth breathing without an artificial airway, even in obese adults. The victim's alveolar carbon dioxide level remains below normal and his arterial oxygen saturation above normal because of mild hyperventilation on the part of the rescuer. The teachability of mouth-to-mouth breathing is demonstrated by the fact that 90% of 164 untrained rescuers performed this method satisfactorily after one demonstration. Women and children who weigh 45.4 kg. (100 lb.) can ventilate adequately victims who weigh approximately 91 kg. (200 lb.). The technical details described in figure 1 are necessary for successful performance of mouth-to-mouth breathing by lay rescuers. Thus, our data indicate clearly that the expired air inflation methods should be taught for general use in both adults and children.

This study was supported by the Division of Research and Development, Office of the Surgeon General, Department of the Army.

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DISCOVERIES BY PATHOLOGISTS.—The pathologist has independently led the way to many important discoveries. Witness the history of our knowledge of the functions of the pituitary gland. It was Pierre Marie who, in 1886, discovered the relation of the anterior lobe of this gland to acromegaly and the pathologist, Benda, who discovered in 1900 that the pituitary tumors of acromegaly and gigantism of man consisted chiefly of acidophilic (alpha) cells. Benda referred to 2 remarkable papers by Dr. Woods Hutchinson, Professor of Comparative Pathology in the University of Buffalo. In 1898 and 1900, Hutchinson described the clinical features and the gross and microscopic pathology of tumors of gigantism and acromegaly. He made no mention of a differentiation of eosinophilic cells. He was apparently the first, however, to indicate that these tumors have cells that secrete a "growth-regulating" substance. It was too bad that he had not been able to see, by means of his staining method, the differentiation of alpha cells, although he did say that these tumors consisted chiefly of a single type of epithelial cell that resembled the embryonic cells of Rathke's pouch. In the same year, 1900, Benda clearly established the fact that such tumors comprised chiefly eosinophilic cells, and he pointed out that these cells are the ones that probably produce the growth substance of Hutchinson. From then on pathologists were lost in the scuffle, for it was P. E. Smith, anatomist of Columbia, and MacDowell, geneticist of Cold Spring Harbor, who found that the hereditary dwarf mouse possessed no acidophils. Little was done until 1924, when Herbert Evans, and also Bailey and Cushing, studied this gland in man and the rat. Later, P. E. Smith launched his series of studies on hypophysectomy in 1930. So it was the anatomists, the geneticists, the physiologists, and the endocrinologists who exploited the basic findings of the pathologists, Hutchinson and Benda.—H. L. Stewart, M.D., The Clinical Pathologist in Research (Ward Burdick Address), *American Journal of Clinical Pathology*, January, 1958.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

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Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

A. M. A. OBJECTIVES AND BASIC PROGRAMS

LAST year the Board of Trustees of the American Medical Association employed a management-consulting firm to appraise many aspects of the structure and functioning of the Association. The report was sent to all members of the House of Delegates and to the officers of the state medical societies. At the Clinical Meeting in Philadelphia last December the Hyland Committee presented its analysis of the report of the consulting firm. The Speaker was instructed by the House to appoint a committee of six composed of three representatives of the Board of Trustees and three representatives of the House of Delegates (Drs. James Z. Appel, Hugh H. Hussey Jr., and Raymond M. McKeown of the Board of Trustees; and Drs. Lewis A. Alesen (chairman), Thurman B. Givan, and Milford O. Rouse of the House of Delegates), to be called the Committee to Study A. M. A. Objectives and Basic Programs. It was charged with the responsibility to study and report on the following topics: (*a*) redefinition of the central concept of A. M. A. objectives and basic programs; (*b*) placing more emphasis on scientific activities; (*c*) taking the lead in creating more cohesion among national medical societies; and (*d*) studying socioeconomic problems.

The Committee is earnestly seeking constructive criticisms from thousands of physicians regarding these four areas. It has prepared a list of 10 questions which are or will soon be sent to the past-Presidents, the officers and trustees, the delegates and the alternate delegates of the A. M. A. House of Delegates, the state and county society officers and editors, and to officers of other national medical organizations. In addition to this group of physicians selected according to position held, a probability sample of several thousand names from the directory files will be selected for separate mailing. Any physician in the United States, member or nonmember, may obtain a copy of these 10 questions and a statement of the genesis and purposes of this Committee by addressing a request to F. J. L. Blasingame, M.D., General Manager, American Medical Association, 535 N. Dearborn St., Chicago 10. Every physician who receives a copy of the questionnaire is urged to give it prompt consideration.

POLIOMYELITIS VIRUS ISOLATED FROM A PARAKEET

A recent report in the *Lancet*[1] seems to merit further attention at this time of year when poliomyelitis usually becomes more prevalent. A sick parakeet (a budgerigar) which was recovering from paralysis of its legs took hold of the lip of a boy aged 9 with its beak and held on until it was removed by the boy's mother. The child became ill a week later and died within a few days of bulbar poliomyelitis. Type 1 poliovirus was recovered from his stool, as it was from the bird's droppings. The bird was killed, and from its intestinal contents poliovirus type 1 again was isolated. Another bird which had been kept in the same cage had died a few days earlier from a similar attack of paralysis. Dr. R. G. Sommerville and associates of the University of Glasgow virus laboratory, who reported the case, call attention to the possibility of transmission of poliomyelitis by domestic pets. The implication in their paper is that the parakeet became infected with poliomyelitis and that the boy was infected when bitten by the bird. The *Lancet* points out in an editorial that, while this is not the only possible explanation, any other one would require a series of strange coincidences to explain all of the facts.

Heretofore, it has been thought that no animal other than man becomes infected with poliomyelitis under natural conditions. It is well to recall, however, that not long ago poliomyelitis virus was thought to be strictly neurotropic, capable of infecting primates only. It is now clear that this virus can be cultivated in vitro in diverse primate cells and in "transformed" cells of rabbit kidney and of the chick chorioallantoic membrane. Some strains of poliovirus can be passed serially by the intracerebral and intraspinal routes in rodents and in the chick embryo. Furthermore, clinical observations have suggested symptoms not necessarily always confined to the neuromuscular system. Of course other observations have caused wonderment concerning whether such clinical manifestations are truly caused by a poliomyelitis virus or by some other but seemingly related organism. There is, therefore, no fundamental reason why polioviruses should not infect parakeets. If this can be established experimentally a whole new facet of the epidemiology of poliomyelitis will need to be reinvestigated.

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[1] Sommerville, R. G.; Monro, I. C.; and Cuthbert, C. C.: Poliovirus Type 1 Isolated from Budgerigar, Lancet 1:512 (March 8) 1958; Poliomyelitis Virus from Budgerigar, Annotations, ibid. 1:518 (March 8) 1958.

ORGANIZATION SECTION

REPORT OF BOARD OF TRUSTEES

To the Members of the House of Delegates of the American Medical Association:

The following report of the Board of Trustees is respectfully submitted:

Financial Statement

The official 1957 financial reports of the Treasurer and of the Association's auditors appear as a part of this report.

The balance sheet and accompanying statements are presented this year on a comparative basis and therefore comments, for the most part, can be eliminated.

Membership dues were received from 138,600 members in 1957 as compared with receipts from 136,000 in 1956.

Association investments earned $362,064 in 1957 for an over-all yield of 3.16%, compared with $293,112 and a yield of 2.96% in 1956.

Report on Matters Referred by House of Delegates

Aviation Medicine.—In Philadelphia (December, 1957) the House of Delegates approved a resolution recommending that a completely adequate and competent Medical Department be established in the Civil Aeronautics Administration directly responsible to the CAA Administrator and recommending further that appropriate legislation to accomplish the purposes of the resolution be supported by the Association.

In compliance with that directive a statement was sent to Senator Warren G. Magnuson, Chairman of the Committee on Interstate and Foreign Commerce, urging the passage of S. 1045, 85th Congress, which would provide for the (1) transfer of the rule-making authority for medical standards from the Civil Aeronautics Board to the Civil Aeronautics Administration; (2) creation of the "Office of Civil Air Surgeon" which would be directly responsible to the Civil Aeronautics Administrator; and (3) establishment of a Civil Aeronautics Medical Research Laboratory. In the A. M. A. testimony attention was called to the A. M. A. Committee on Aviation Medicine and to the fact that physical standards for and medical evaluation of pilots must be carried out by physicians experienced in aviation medicine.

Identification of Hospital Solutions.—In accordance with the action of the House of Delegates in June, 1957, the Board of Trustees referred to the Council on Drugs the resolution requesting an investigation of the feasibility of developing a uniform system for identification of solutions used in hospitals.

The Council, after carefully considering the many difficulties in the use of color, colored labels, special tags, abbreviations, and oddly shaped containers, stated that it believed that the problem of mistakes in identity and improper use of solutions and drugs for any purpose both inside and outside hospitals can best be met by greater emphasis on the education of all health personnel and patients to exercise due care in consulting and applying properly informative labels. Care should be taken to insure legibility of container labels by prominent display of the name or active ingredient as well as the potency and dosage of drug preparations. Details which might overshadow such information should be separately presented as a package enclosure.

The complete report of the Council, in which the Board concurs, will be found in The Journal, April 19, 1958 issue, page 1988.

Vaccine Distribution.—In December, 1957, the House of Delegates adopted a resolution requesting the Board of Trustees, through its established joint committees with the American Pharmaceutical Association, the National Association of Retail Druggists, and the American Drug Manufacturers Association, to seek conferences with a view to establishing a code of practice regulating the future distribution of important therapeutic products, so that the best interest of all the people may be served.

The subject of distribution of drugs in scarce supply as, for instance, poliomyelitis vaccine and Asian influenza vaccine, was discussed by the Joint Liaison Committee on Pharmacy and Medicine and it was the consensus that state and local medical and pharmaceutical associations be encouraged to organize to handle such situations at the local level.

In this connection, the special Committee on Influenza, appointed by the Board of Trustees some time ago, met in December, 1957, to consider the resolution adopted by the House in its relation to a program of effective communication systems, operation of informational and educational plans within health and medical groups as well as for the general public, the establishment of priorities among groups and individuals to receive vaccine or other therapeutic products, and the creation of appropriate national, state and local health and medical advisory groups to guide and otherwise assist in the implementation of a program, as well as the distribution of important therapeutic products. The Committee felt that the Association should exercise leadership in developing a complete stand-by program and in this the Board concurred.

With this in mind, therefore, the Board requested the Committee on Influenza, in cooperation with the Law Department, to proceed with the development of a stand-by program to deal with mass immunization or similar situations. A meeting of the Committee was scheduled for the latter part of April; a supplementary report will no doubt be made to the House by the Board at the meeting in June.

Rehabilitation Consultation Service.—In December, 1955, the House of Delegates approved a report which (1) called for the establishment of an integrated rehabilitation consultation service to state societies, and (2) requested that an outline on policy and procedure be prepared for the guidance of local professional groups in dealing with the total program of rehabilitation, and referred the matter to the Board of Trustees.

In June, 1957, the Board reported that its Committee on Rehabilitation had taken cognizance of the report and was setting about implementing it so far as it was practicable and possible. In considering the Board's report the House of Delegates agreed with the Reference Committee on Reports of Board of Trustees and Secretary that the A. M. A. should assume a position of leadership in uniting the several rehabilitation services under medical leadership, and that a program of education in these objectives would benefit American physicians and contribute toward realization of a total concept of rehabilitation. The House further recognized that many problems are implicit in this endeavor and recommended that the Committee on Rehabilitation be instructed to study and explore a coordinated program as outlined above.

In The Journal, Aug. 31, 1957, page 2054, the Committee on Rehabilitation published a report, which outlines the steps the Committee has taken and plans to take to carry out the request of the House of Delegates.

American Retirement Plan.—The Board of Trustees considered resolution 13, introduced at the Philadelphia meeting (December, 1957), requesting that Congress institute an investigation of the Social Security System and direct a private, nonpolitical, unbiased agency to develop a retirement system "based on sound actuarial principles and including a combination of the insurance and annuity principle with investment in the growth of the nation's economy through equity participation such as is now available through the mutual funds." It also reviewed the comparable proposals adopted by the House in December, 1955, and June, 1956.

After careful consideration of the probability of success of an investigation of the Social Security System by the American Medical Association, as well as the expenditure of funds that would be necessary in order to undertake and complete the task, the Board is of the opinion that it would not be feasible for the A. M. A. to conduct such an investigation.

Radioactive Isotopes.—In June, 1957, a resolution was introduced recommending that the A. M. A. support an amendment to the Atomic Energy Act of 1954 relative to licensure of physicians to use, own, or import radioactive material. On recommendation of the Reference Committee on Legislation and Public Relations the resolution was referred to the Board for further study.

The subject matter of the resolution was referred to the Council on Medical Physics with a request for study with a view to the appointment of a special committee in this area. After extensive research and discussion the Council recommended that such a committee be established, to be known as the Committee on Atomic Medicine and Ionizing Radiation, and that its activities and primary responsibilities should initially include the following: (1) an educational program directed to medical students, interns, residents, and physicians in practice on the safe and proper uses of ionizing radiation; (2) formulation of recommendations on A. M. A. policies that have to do with licensure and other "permissions and authorizations" for physicians to use radioactive material; (3) relationships within hospitals regarding staff use of radioisotopes; (4) formulation of recommendations on A. M. A. policies concerning governmental legislative action (at both federal and state level) regarding radiation safety regulations; and (5) cooperation with other scientific bodies concerned with radiation problems.

Referrals.—Those resolutions referred to the Board for referral to the appropriate council, committee, or department have been so forwarded. As soon as reports are available from these groups, they will be transmitted to the House of Delegates.

Supplementary Reports.—Supplementary reports on certain subjects that have been referred to the Board by the House of Delegates and on other matters of interest will be presented at the first meeting in San Francisco.

Respectfully submitted,

Edwin S. Hamilton, Chairman
Leonard W. Larson, Vice-chairman
Julian P. Price, Secretary
James Z. Appel
George M. Fister
Hugh H. Hussey Jr.
Raymond M. McKeown
Cleon Nafe
David B. Allman
Gunnar Gundersen
Jesse Hamer }
J. J. Moore } ex officio
E. Vincent Askey }

ACCOUNTANTS' REPORT

March 4, 1958

The Board of Trustees,
American Medical Association:

We have examined the balance sheet of the American Medical Association as of Dec. 31, 1957, and the related statement of income and fund balance for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and statement of income and fund balance present fairly the financial position of American Medical Association at Dec. 31, 1957, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

The accompanying schedule, though not considered necessary for a fair presentation of the results of operations, is presented only for an informative purpose. While our examination was made primarily for the purpose of formulating our opinion on the current year's basic financial statements, the additional data have been subjected to the same audit procedures and, in our opinion, are stated fairly in all material respects when considered in conjunction with the financial statements taken as a whole.

Peat, Marwick, Mitchell & Co.

BALANCE SHEET—Dec. 31, 1957, with Comparative Figures for 1956

Assets	1957	1956
Cash	$ 336,150	$ 108,2
Accounts receivable:		
Advertising	506,744	413,7
Directory report service	26,526	41,0
Other	55,384	85,2
	$ 588,654	$ 543,0
Interest accrued on investments	$ 75,927	$ 41,5
Inventories of materials and supplies, *at cost*	392,715	374,1
Expenditures on publications in process	102,947	183,7
Prepaid expenses, deposits, and advances:		
Deposits and advances	120,895	[illegible]
Commission applicable to unexpired subscriptions to publications	649,051	477,7
Insurance and other prepaid expenses	84,270	[illegible]
	$ 854,216	$ 616,1
Marketable securities and other investments, at cost (security values based on market quotations—1957, $9,909,622; 1956, $8,639,716—other investments based on cost) (note 1):		
United States Government securities	$ 7,669,330	$ 6,557,
Public utility and industrial bonds	527,728	[illegible]
Common stocks	1,408,417	1,378,
Other investments	46,785	
	$ 9,652,260	$ 8,459,
American Medical Association Research Fund:		
United States Government securities, at cost (value based on market quotations—1957, $1,474,552; 1956, $1,451,393)	$ 1,479,669	$ 1,4
Cash	9,981	[illegible]
	$ 1,489,650	$ 1,43
Property, plant, and equipment, at cost (note 2)	$ 3,303,860	$ 3,2
Less allowance for depreciation	1,432,428	1,3
	$ 1,871,432	$ 1,9
	$15,363,951	$13,7

Liabilities	1957	19
Accounts payable and accrued expenses:		
Accounts payable	$ 584,615	$ [illegible]
Accrued payroll	32,576	[illegible]
Accrued taxes	83,103	[illegible]
Employees' withholding taxes	50,311	[illegible]
	$ 750,605	$ 5
Provision for completion costs of cumulative index volumes to be issued (less amount recoverable by subscription—1957, $190,985; 1956, $174,095)	$ 169,296	$ 1

Deferred credits:		
Unexpired subscriptions to publications	1,626,654	1,512,072
Income from 20th edition directory report service (less accumulated costs applicable to directory—1957, $382,958; 1956, $174,095)	420,224	113,833
Other, including dues received in advance	49,008	24,865
	$ 2,095,886	$ 1,650,770
American Medical Association Research Fund reserve	$ 1,489,650	$ 1,494,100
Other reserves:		
Association	350,000	350,000
Retirement	400,000	400,000
Building improvement and modernization	1,000,000	1,000,000
Equipment modernization	200,000	200,000
Building replacement	1,860,000	1,860,000
	$ 3,810,000	$ 3,810,000
Fund balance (Exhibit B) (note 2)	7,048,514	6,041,109
	$15,363,951	$13,736,347

STATEMENT OF INCOME AND FUND BALANCE

Year ended Dec. 31, 1957, with comparative figures for 1956

	1957	1956
Income.		
Membership dues and subscriptions to periodical publications	$ 5,393,378	$ 5,192,650
Advertising	5,893,100	4,943,003
Income from investments	362,064	293,112
Other income	62,294	174,070
	$11,710,836	$10,602,835
Costs and expenses:		
Printing and publication costs of periodicals, books, and pamphlets	5,965,567	5,222,444
Councils, bureaus, and related activities (Schedule 1)	4,173,083	3,727,966
Other expenses (including annual and interim meetings, net—1957, $103,678; 1956, $45,225)	351,131	355,972
	$10,489,781	$ 9,306,382
	$ 1,221,055	$ 1,296,453
Special income credits (charges):		
Income from 19th edition directory report service and copy sales, less costs applicable thereto		425,683
Excess (deficiency) of credits over charges in connection with the closing of the printing department (note 3)	(113,650)	84,811
Contribution to American Medical Educational Foundation	(100,000)	(125,000)
	(213,650)	385,494
Income in excess of costs and expenses	1,007,405	1,681,947
Deduct appropriations, net:		
Building replacement reserve		1,860,000
Retirement reserve		250,000
		2,110,000
Less decrease in equipment modernization reserve		500,000
		1,610,000
Net amount transferred to fund balance	1,007,405	71,947
Fund balance at beginning of year	6,041,109	5,969,162
Fund balance at end of year	$ 7,048,514	$ 6,041,109

Notes:

(1) *Marketable securities and other investments, at cost*

The value of marketable securities and other investments, as recorded on the books, applicable to unrestricted and restricted funds is presented in the following comparative statement:

	1957	1956
Unrestricted — general	$ 4,407,260	$ 3,284,351
Restricted:		
Depreciation reserve	1,435,000	1,365,000
Association reserve	350,000	350,000
Retirement reserve	400,000	400,000
Building improvement and modernization	1,000,000	1,000,000
Equipment modernization	200,000	200,000
Building replacement	1,860,000	1,860,000
	5,245,000	5,175,000
	$ 9,652,260	$ 8,459,351

(2) *Property, plant, and equipment*

A summary of property, plant, and equipment, and related allowances for depreciation, representing the net book value of fixed assets included in the general fund balance of the Association at Dec. 31, 1957, is presented as follows:

	Cost	Allowance for Depreciation	Net Book Value
Land	$ 453,774		$ 453,774
Building	2,198,531	$1,096,259	1,102,272
Machinery and equipment	126,404	70,205	56,199
Furniture and office equipment	525,151	265,964	259,187
	$3,303,860	$1,432,428	$1,871,432

(3) *Printing department*

During 1956, the Association entered into contracts with outside parties for the printing of its periodical publications. The excess of charges over credits in the process of closing the department for the current year was $113,650 as compared to an excess of credits over charges in the preceding year of $84,811.

Contingency

At Dec. 31, 1957, the Association had a contract payable to Harper Richards in the amount of $28,604.06 for architectural services pertaining to the remodeling of the American Medical Association building.

COUNCILS, BUREAUS, AND RELATED ACTIVITIES

Year ended Dec. 31, 1957, with comparative figures for 1956

	1957	1956
Secretary's office	$ 156,653	$ 96,430
Association activities	458,379	325,948
Association trustees		14,616
Membership records	198,595	201,608
Law department	135,943	110,729
Biographical records	138,003	155,020
American Medical Education Foundation	111,095	118,833
Department of Public Relations	499,906	390,519
Washington office of A. M. A.	249,278	226,817
Chemical laboratory	93,865	88,493
Council on Medical Education and Hospitals	370,215	376,484
Council on Medical Service	234,310	206,226
Council on Drugs	108,926	99,401
Council on Medical Physics	55,878	61,265
Council on Foods and Nutrition	71,590	55,536
Council on Industrial Health	91,909	75,772
Council on National Defense	51,091	41,482
Council on Rural Health	67,551	67,803
Council on Constitution and Bylaws	3,576	3,148
Division of Councils on Therapy and Research	62,153	64,099
Judicial council	14,222	13,010
A. M. A. library	77,759	80,829
Bureau of Exhibits	90,379	109,243
Bureau of Health Education	316,173	296,446
Bureau of Investigation	47,837	47,957
Bureau of Medical Economic Research	108,214	172,764
Committee on Cosmetics	27,338	25,684
Council on Mental Health	45,199	36,544
Committee on Research	66,360	64,653
Committee on Legislation	20,153	20,725
Committee on Medico Legal Problems	8,587	8,962
Committee on Rehabilitation	3,968	
Machine records	187,888	61,980
	$ 4,173,083	$ 3,727,966

REPORT OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

To the Members of the House of Delegates of the American Medical Association:

The Council on Medical Education and Hospitals desires to make the following interim report to the House of Delegates and would appreciate consideration of these matters at this session of the House.

Revision of Essentials for Internship and Residency Training

In view of the development of the Educational Council for Foreign Medical Graduates, Inc., sponsored by the American Medical Association, the American Hospital Association, the Association of American Medical Colleges, and the Federation of State Medical Boards of the United States, the Council should like to request that the House of Delegates approve the following revision of the "Essentials of an Approved Internship" and the "Essentials of Approved Residencies and Fellowships." These revisions are needed to incorporate a section on "Selection of Interns" and "Selection of Residents" which include reference to this new evaluating service.

Essentials of an Approved Internship

III. Selection of Interns

The development of a satisfactory program requires first of all, a careful selection of applicants for appointment to the intern staff. The hospital administration and the medical staff, through appropriate review of credentials, should ascertain that the personal and medical qualifications of applicants selected for internship positions are satisfactory. There should be confidence that the interns appointed have the high standards of integrity, motivation, industry, resourcefulness, health, and basic medical knowledge necessary to take full advantage of the further educational experience offered. This should include assignment of carefully graded and progressive responsibility for patient care. The qualifications of the intern staff should leave no doubt as to their competence to accept this assignment since the primary obligation to the hospital must be for the patients' welfare. Personality characteristics can usually be evaluated through personal interview and/or letters of recommendation. For graduates of schools in the United States and Canada, the medical school accreditation program of the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges renders reasonable assurance in regard to medical qualifications. Such candidates for appointment should be graduates of approved medical schools. Further individual knowledge can be obtained through direct communication with the dean's office of the school concerned.

Since similar sources and kinds of information have not been readily available for graduates of foreign medical schools, the Educational Council for Foreign Medical Graduates, 1710 Orrington Ave., Evanston, Ill., has been established to provide as comparable knowledge of qualifications as possible. The Council recommends that hospitals considering foreign medical school graduates for internship positions acquire reasonable assurance in regard to their medical qualifications through utilization of the program of the Educational Council.

Essentials of Approved Residencies and Fellowships

I. General Requirements

6. Selection of Residents

The development of a satisfactory program requires, first of all, a careful selection of applicants for appointment to the resident staff. The hospital administration and medical staff, through appropriate review of credentials, should ascertain that the personal and medical qualifications of applicants selected for residency positions are satisfactory. There should be confidence that the residents appointed have the high standards of integrity, motivation, industry, resourcefulness, health, and basic medical knowledge necessary to take full advantage of the further educational experience offered. This should include assignment of carefully graded and progressive responsibility for patient care. The qualifications of the resident staff should leave no doubt as to their competence to accept this assignment, since the primary obligation of the hospital must be for the patients' welfare.

For those applicants who have had their prior medical training in the United States or Canada, evaluation of qualifications is usually not difficult. Personality characteristics can be assessed through interview, letters of recommendation and communication with the hospital where internship was served, and the dean's office of the medical school. The medical school accreditation and internship review programs of the Council on Medical Education and Hospitals of the American Medical Association renders reasonable assurance in regard to medical qualifications which can be augmented through communication with the hospital and school concerned. Such candidates for appointment should be graduates of approved schools and should have served an internship of at least one year in an approved hospital. (See pertinent sections under Special Requirements, pp. 17 to 48.)

Since similar sources and kinds of information have n been readily available for graduates of foreign medic schools, the Educational Council for Foreign Medical Gra uates, 1710 Orrington Ave., Evanston, Ill., has been esta lished to provide as comparable knowledge of qualificatio as possible. The Council recommends that hospitals co sidering foreign medical school graduates for residen positions acquire reasonable assurance in regard to the medical qualifications through utilization of the program the Educational Council. Before appointment of such candidate to a residency position, the hospital should assu itself that he has had the equivalent of a year's approv internship. If the foreign graduate has served an approv internship in this country and has already been certified the Educational Council, there is nothing to be gained repeating the process.

Residency Training in Otolaryngology

On the recommendation of the Residency Review Committee for Otolaryngology, the Council would like to subm the following revision of the section on "Scope of Trainin of the "Essentials of Approved Residencies and Fellowships in otolaryngology. The major revision is with reference requiring adequate further training for those individua wishing to qualify in tumor surgery of the head and nec

Residencies in otolaryngology should offer a broad trai ing and should preferably include some experience in close related fields of surgery. Adequate clinical and operativ experience should be provided. Essential equipment f diagnosis and treatment should be available, including a special apparatus. The clinical material should be sufficie in variety and amount to provide full training in the variou divisions of the specialty. Adequate experience in broncho esophagology, allergy, anesthesiology, maxillofacial surger and surgery of the neck, as they relate to otolaryngolog must be provided. The training shall include a systemati course of instruction with demonstrations on clinical an technical subjects pertinent to the various phases of otolaryngology. It is recognized that those individuals wishin to qualify in tumor surgery of the head and neck must hav adequate further training beyond the present three years requirement in otolaryngology.

Essentials of an Acceptable School of Medical Technology

Following several years of study and on unanimous recommendation by the Council's advisory groups in medical technology, the Board of Schools of Medical Technology, (ASCP), the Board of Registry of Medical Technologists, (ASCP), the Executive Committee of the American Society of Clinical Pathologists, and the American Society of Medical Technologists, the following revised sections of the "Essentials" are submitted to the House of Delegates with the request that they be approved.

The one major revision is an increase, to be effective Jan. 1, 1962, in the entrance requirements. An increase in the pre-technical collegiate education from two to three years of college, to include additional courses to broaden the science background, is recommended. No major change in the subsequent 12 months' technical curriculum is recommended. These changes have been requested only afte extensive study by the ASCP and its committees concern with medical technology, which have met several times fo full exploration of the matter with the Council. Revisio suggested are:

PREAMBLE

Three organizations are primarily concerned with t training of medical technologists, the Council on Med Education and Hospitals of the American Medical Asso tion, the American Society of Clinical Pathologists, and t American Society of Medical Technologists. Two Boards o the American Society of Clinical Pathologists represent this Society. The Board of Schools of Medical Technology is primarily concerned with the evaluation and inspection of schools of medical technology, acting in an advisory capacity to the Council, assisting also in the maintenance of high standards of education and in the development of new schools of medical technology. The Board of Registry of Medical Technologists investigates and certifies the competency of the technologists.

The Council, with the cooperation of the Board of Schools of Medical Technology, the Board of Registry of Medical Technologists, and the American Society of Medical Technologists, *has established the following standards for this* type of training for the information of schools, physicians, hospitals, prospective students, and others and for the protection of the public.

Technologists are being trained in these schools to work under the direction of qualified physicians and not as independent practitioners.

IV. PREREQUISITES FOR ADMISSION

10. Admission requirements are as follows: Two years, 90 quarter hours, or 60 semester hours of college work in a college or university accredited by a recognized standardizing association. During the two years the following courses must be taken: (1) Eighteen quarter hours or 12 semester hours of biology which may include general biology, bacteriology, parasitology, physiology, anatomy, histology, embryology, and zoology (bacteriology is especially recommended); (2) One full academic year (a minimum of 9 quarter hours or 6 semester hours) of beginning inorganic chemistry, which may include qualitative analysis, including lectures and laboratory; and in addition a minimum of 4 quarter hours or 3 semester hours of either quantitative analysis, organic chemistry or biochemistry, including lectures and laboratory (quantitative analysis is especially recommended); (3) Electives sufficient to give a total of 90 quarter hours or 60 semester hours of college credit. The following courses are highly recommended but they are not required: physics, a course in general mathematics, and typing.

Only those individuals having the above educational requirements may participate as students in this entire program. Schools are encouraged to accept only students having three years of college and to participate in affiliated programs leading to a degree.

Effective Jan. 1, 1962, the pre-technical educational requirements for admission to a school of medical technology approved by the Council will be increased from two years (60 semester or 90 quarter hours) to three years (90 semester hours or 135 quarter hours) to include additional courses to broaden the science background.

V. CURRICULUM

11. The course of training should not be less than 12 months in duration and should include the following subjects: biochemistry, hematology, bacteriology, parasitology, histologic technic, serology, urinanalysis, blood banking, basal metabolism, and miscellaneous clinical microscopy.

Respectfully submitted,

Leland S. McKittrick, Chairman
James M. Faulkner, Vice-chairman
Warde B. Allan
W. Andrew Bunten
Guy A. Caldwell
John W. Cline
Harlan English
Victor Johnson
Charles T. Stone
W. Clarke Wescoe
Edward L. Turner, Secretary

TRIPLE MEDICAL CIVIL DEFENSE PROGRAM IN SAN FRANCISCO

Medical preparedness for disaster—as it is pursued at the local, national, and armed forces levels—will highlight three days of activity in San Francisco late in June, prior to the opening of the American Medical Association's 107th Annual Meeting. Sponsoring groups include the A. M. A. Council on National Defense, the Twelfth Naval District, and the Alameda-Contra Costa Medical Association.

A. M. A. Conference

Dr. Gunnar Gundersen, A. M. A. President-elect, will open the Sixth Annual National Medical Civil Defense Conference with a welcoming address in the Rose Room of the Sheraton-Palace hotel on Saturday, June 21.

At the morning session, high-ranking officials of the federal government will discuss specific civil defense programs of their respective agencies. Some plans and current concepts of the Federal Civil Defense Administration will be outlined by Leo A. Hoegh, administrator of the FCDA. Congressman R. Walter Riehlman is scheduled to discuss the congressional program to strengthen civil defense efforts, and Dr. LeRoy D. Fothergill, scientific advisor to the chief chemical officer of the Army, will report on Biological Warfare and Its Defenses.

National resources in fulfilling civil defense requirements will be the topic of a talk by Dr. W. Palmer Dearing, assistant director for health of the Office of Defense Mobilization. Dr. Robert L. Smith, assistant administrator of health and medical affairs for FCDA, will discuss the planning and employment of a national medical and health program for civil defense. Dr. William H. Reiff, civil defense chairman of the Oklahoma State Medical Association, will highlight some problems encountered in local medical plans for preparedness and will suggest ways and means to cope with these situations.

Hospitals with "paper plans for disaster operations" often find it difficult to set up and run an exercise to test the adequacy of their programs. Dr. Max L. Lichter, a member of the A. M. A. Committee on Civil Defense, will explain how to test a hospital plan.

One feature of the program will be a panel discussion on The Role of Civilian Physicians in Support of a Civil Emergency by the three surgeons general of the military departments and the surgeon general of the U. S. Public Health Service. Dr. Harold C. Lueth, Chairman of the A. M. A. Committee on Civil Defense and a member of the A. M. A. Council on National Defense, will preside at this discussion. Those participating will be Army Major Gen. Silas B. Hays, Rear Adm. B. W. Hogan, Air Force Major Gen: Dan C. Ogle, and Dr. Leroy E. Burney of the Public Health Service.

The newly created radiologic health division of the Public Health Service will be discussed by its director, Dr. Francis J. Weber. Dr. Frank F. Schade, chief of the medical and health section of the Los Angeles County and Cities Civil Defense Planning Board, will describe features which have led to successful implementation of the California Medical Civil Defense Plan. This plan is one of several state programs which has received the active support of its medical and health groups.

(Additional details of the A. M. A.-sponsored session are available from Frank W. Barton, Secretary, Council on National Defense, American Medical Association, 535 N. Dearborn St., Chicago 10.)

Navy Symposium

The Navy is sponsoring a symposium on "Medical Problems of Modern Warfare and Civil Defense" on June 19 and 20, at the U. S. Naval Radiological Defense Laboratory in San Francisco. Rear Adm. George L. Russell, Commandant of the Twelfth Naval District, is scheduled to open the session and welcome participants. Retired Army Brig. Gen. Crawford F. Sams and Dr. Riojun Kinosita will report on atomic bomb effects in Hiroshima and Nagasaki. The blast and thermal effects, radioactive fall-out, and estimate of casualties should an enemy attack be made on the San Francisco Bay Area will be the subject of presentations by Navy Capt. J. H. McQuilkin and General Sams.

At the afternoon session, Navy Capt. Cecil H. Coggins will discuss the vulnerability of the Bay Area to attack by biological and chemical weapons. Dr. David B. Allman, President of the American Medical Association, and Mr. Frank W. Barton, Secretary of the A. M. A. Council on National Defense, will speak on the plans and activities of organized medicine for medical preparedness in natural disasters or in the event of all-out war.

Topics and speakers on the second day include Present Day Radiation Hazards by Robert R. Newell, M.D., and Edward Alpen, Ph.D.; Current Medical Thinking and Planning for Civil Defense by Drs. Robert L. Smith, Frank L. Cole, and Rear Adm. A. G. Cook; and Military Management of Mass Casualties by Army Lieut. Col. H. Haskell Ziperman. Mr. Herman Kahn will discuss a systems analysis of civil defense, and Capt. A. R. Behnke of the Navy will speak on physiological factors in individual and group survival.

(Individuals who desire to attend the Naval Symposium should make an early reservation by writing to Capt. Wilbur E. Kellum, M. C., U. S. N., District Medical Office, Twelfth Naval District, 50 Fell St., San Francisco.)

Test Exercise Star

Immediately following the Navy symposium, on the evening of June 20, the Alameda–Contra Costa Medical Association is sponsoring Test Exercise Star. Taking part in the drill will be some 15 general hospitals in the two-county area. The disaster in
dent will be based on the assumption of an eart
quake of severe intensity.

At 7 p. m. mobilization of medical personnel
respective disaster sites, as well as at hospitals, w
have been completed. Mock casualties will th
begin evacuation from disaster sites to respecti
hospitals for triage and definitive treatment. It
contemplated the drill will be completed by a
proximately 10 p. m. Designated hospitals will th
conduct half-hour demonstration clinics in assign
disaster injuries, covering in particular their tre
ment.

Members of the Alameda–Contra Costa Me
cal Association will man a command post for th
two-county exercise—coordinating available hospit
beds, physicians, nurses, and use of ancillary me
cal personnel. The command post also will be
blood procurement center.

This exercise will be conducted in cooperati
with units of the armed forces in the Bay Are
Members of the A. M. A. attending the conf
ence on civil defense in San Francisco, on June 2
are invited to witness the exercise.

It is urgently requested that those desiring
attend the exercise write to Chairman, Disast
Committee, Alameda–Contra Costa Medical Ass
ciation, 6230 Claremont Ave., Oakland 18, Cali
by June 1st. This is necessary in order that tran
portation as well as further instructions coverin
this event may be provided for spectators.

DOCTOR-PRESS RAPPORT IN NORTH CAROLINA

Are medical men an uncooperative group wh
refuse to provide the press with news the publi
wants and needs? Do newspaper reporters disto
medical news and expect physicians to violate ethic
by disclosing confidential information about pa
tients? Newsmen and doctors have raised question
like these quite frequently in the past. But, accord
ing to a research report from the University o
North Carolina, the answer to both questions appears to be "No."

The report indicates that most editors—at least in
North Carolina—believe physicians are becoming
increasingly cooperative as news sources, and most
medical men who have furnished information to the
press feel they were treated fairly and that the news
as printed was accurate. Completion of the North
Carolina press–medical project, a two and a half
year study, was announced by Roy E. Carter Jr., a
former reporter, editor, and editorial writer who
holds a joint appointment as professor in the School
of Journalism and research professor in the Institute
for Research in Social Science at the University of
North Carolina. Carter conducted the study for the
Medical Society of the State of North Carolina.

The 155-page report summarizes results of a series of questionnaire studies, newspaper and magazine content studies, and detailed interviews with newsmen, medical news sources, and hospital administrators. The study represents an analysis of 1,771 news items and the opinions of more than 100 newsmen and more than 350 physicians. It is believed to be the first ever conducted on a state level.

"Although the project findings indicate there is a willingness on the part of both groups to help eliminate barriers to medical news coverage, some very real barriers still exist," Carter said. "Doctors subscribe to an ethical code which forbids their seeking publicity, and many newsmen regard medical news as a difficult and technical field in which to work."

Financed jointly by the state medical society and the university, the project was carried out with the assistance of a press advisory committee consisting of Holt McPherson, editor of the High Point *Enterprise,* Sam Ragan, executive editor of the Raleigh *News and Observer* and *Times;* and Worth Bacon, managing editor of the Winston-Salem *Journal.* Medical advisory committee members were Dr John S Rhodes of Raleigh, chairman; Dr. Thomas T Jones of Durham, Dr. C. T. Wilkinson of Wake Forest, and Dr. William P. Richardson of the University of North Carolina School of Medicine, Chapel Hill.

Some additional findings in the project indicate that:

—Editors believe their goals and values in handling medical news are similar to those of physicians, but medical men feel there are real differences—that the editor, for example, places promptness of publication ahead of accuracy. Editors correctly predicted the views of physicians.

—Doctors perceive editors as persons much like themselves, whereas reporters are seen as less good, less valuable, less fair, and so on Yet it is with reporters, generally, that physicians must deal.

—Two professional problems arise when physicians serve as news sources They may be accused of seeking publicity if they are quoted in print, and they may be questioned on scientific grounds if the information they furnish is popularized or shortened by the writer. According to North Carolina doctors, medical items in their hometown papers are more fair than accurate, and more accurate than complete.

—News stories which were described by medical news sources as "misleading" or as having resulted from "irritating" interviews generally were items in which the news contacts were made by newsmen rather than doctors Medical news sources who initiated press contacts, usually did so by personal visit.

—In general, younger editors had more favorable impressions of medical news sources than their elders, whereas among physicians favorable attitudes toward the press occurred more frequently in the older group

FILMS ADDED TO A. M. A. MOTION PICTURE LIBRARY

Two more film subjects from the fracture series produced for the Veterans Administration have been added to the A. M. A. film library. "Fractures About the Knee" was reviewed in The Journal, Jan. 26, 1957, page 308, and "Fractures of the Shaft of the Femur" was reviewed in The Journal, June 1, 1957, page 601. These two basic teaching films on fractures incorporate superb diagrammatic illustrations and excellent photography.

A teaching film from the Mayo Clinic also has been added to the film library. "Technique of Proctoscopy" was the subject of an illustrated film review appearing in The Journal, March 22, 1958. page 1510. This film is an excellent portrayal, step by step, from the taking of the proctologic history to the completion of the proctosigmoidoscopic examination.

ITALIAN PHYSICIANS VISIT HEADQUARTERS

The American Medical Association was host to some 50 physicians and their wives from Milan, Italy, when they visited the headquarters building in Chicago, April 10. Among those welcomed at a reception by George F. Lull, M.D., A. M. A. Secretary (*right*), were Dr. and Mrs. Mario Celotti and Dr. Adele Guffanti. During the 18-day visit to the United States, they toured, at their own expense, medical centers in New York, Washington, D. C., Syracuse, N. Y., Albany, N. Y., Indianapolis, Chicago, Detroit, and Rochester, Minn.

CHANGE OF ADDRESS

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COUNCIL ON MEDICAL SERVICE

SUPPLEMENTARY REPORT NO. 2

MEDICAL CARE FOR THE INDIGENT IN 1957

This is the third in a series of reports published by the Committee on Indigent Care of the American Medical Association's Council on Medical Service. The first report, "Medical Care for the Indigent in 1957" (The Journal, *June 15, 1957, pp. 772-776), summarizes the development of public assistance medical care and the changes made by the 1956 amendments to the Social Security Act. "Supplementary Report No. 1" describes changes made by the 1957 amendments. Copies of both reports may be obtained from the Council on Medical Service.*

The 1956 Social Security Amendments authorized increased federal reimbursement of state public assistance expenditures and "earmarked" part of this increase, known as the "$6-and-$3 formula," for vendor payments for medical care. Through this formula, the federal government reimburses half the money spent by a state in such vendor payments, up to a "maximum matchable" state expenditure of $6 times the number of adult assistance recipients per month and $3 times the number of children receiving assistance per month.

In order to obtain the maximum amount of federal funds, some states found it would be necessary to change the medical care programs they had in operation prior to July 1, 1957, the effective date of the new formula provisions. Among the reasons necessitating such changes are the maximums set on federal reimbursement of vendor payments and the prohibition of "split payments" under the new formula. Many state welfare agencies and medical associations have had difficulty understanding these limitations. The present report is intended to clarify both points. (Some of this material is contained, in less detail, in previous Committee reports.)

"Split Payments"

1. *What is meant by the term "split payment" in reference to public assistance medical care?*

The state welfare agency can disburse money for medical needs of public assistance recipients in two ways: as "money payments" and as "vendor payments." In the money payment method, the agency budgets for the individual's medical costs when determining the amount of his monthly assistance payment and the recipient is expected to pay his own medical bills out of this monthly grant. In the vendor payment method, the welfare agency makes a direct payment to the physician, hospital, nursin home, pharmacist, or other "vendor" of medic services for care provided to the recipient. A spl payment occurs when the agency uses both metho to pay for the same "item of service" for the sam group of assistance recipients.

2. *What would be an example of a split paymen*

As an example, a state might pay $5 per day t hospitals for care of Old Age Assistance recipien and include funds for meeting individual hospit bills above this amount in the money payments t the recipients. Since both vendor and money pa ments would be used to meet hospital costs for th same group of recipients, this would constitute split payment.

3. *How are "items of service" classified to dete mine whether split payments are involved?*

Before federal reimbursement of a state's publi assistance expenditures is authorized, the state mus submit its plan to the Bureau of Public Assistanc of the Social Security Administration in the Depart ment of Health, Education, and Welfare. In thi plan, the state must define all "medical services" t be provided and must apply these definitions rea sonably and consistently.

In most states, services are classified by the per son or facility providing them. For example, hos pital services are usually considered one item, phy sicians' services another, nursing-home care another and drugs another.

4. *Must all physicians' services be considered single item of service?*

No, physicians' services may be divided into rea sonable categories by types of services. For ex ample, a state may legitimately decide to use ven dor payments for physicians' in-hospital services, while including the cost of home and office visits in the money payment. Again, it may use vendor pay ments for surgical services and money payments for medical services.

Members of the Committee on Indigent Care are John F. Burton, M.D., Chairman, Oklahoma City; A. J. Bowles, M.D., Seattle; I. Jay Brightman, M.D., Albany, N. Y.; E. P. Coleman, M.D., Canton, Ill.; Wesley W. Hall, M.D., Reno, Nev.; E. A. Ockuly, M.D., Toledo, Ohio; Dean W. Roberts, M.D., Chicago; Mr. R. M. Hilliard, consultant, Chicago; and Mr. Nelson B. Neff, consultant, Reno, Nev.

5. *Are any exceptions made to the ruling against split payments?*

The only general exception is made in regard to nursing-home services, which may be split into components, such as room and board, nursing services, and other services. One component may be paid through money payments and another through vendor payments.

The individual state plan may also specify vendor payments for particular cases, although the same item is being paid for through money payments to other members of the group. For example, the plan may provide for vendor payments "when the needy individual requests that medical costs be met in this way."

6. *Must payment methods be uniform for all public assistance recipients in a state?*

No, the four public assistance programs, Old Age Assistance (OAA), Aid to the Blind (AB), Aid to Dependent Children (ADC), and Aid to the Permanently and Totally Disabled (APTD), are considered as separate entities. Thus, without any conflict, vendor payments might be used for OAA hospital care and money payments for ADC hospitalization.

7. *Must payment methods in each individual public assistance program be uniform throughout the state?*

No, allowance may be made for differing conditions and needs in different areas. The welfare agency may use vendor payments for a particular item in one area and money payments in another. A split payment occurs only when both methods are used for the same item for the same group of assistance recipients.

8. *When did the Bureau of Public Assistance first prohibit split payments?*

Split payments, as such, did not pose much of a problem to the states until the 1956 Social Security Amendments took effect on July 1, 1957. Prior to that date, federal matching funds were based on the total expenditure per recipient, whether payments were made to the individual or to a vendor of medical services. However, since vendor payments were first authorized, in 1950, the bureau has required that each state's plan include a consistent policy as to which services would be paid for by vendor payments and which by money payments. The prohibition has, therefore, been implicit in bureau policy since that date.

9. *If a state makes a split payment for medical services, how is the federal reimbursement affected?*

The Bureau of Public Assistance approves state plans only if they assure identification of medical care costs to the vendor or the money payment—not both for the same item of service. Federal reimbursement would, therefore, be allowed only on that portion of the payment made in accordance with the approved state plan; the remainder of the payment, made by a method not specified in the approved plan, would not be considered part of the federally aided program and would have to be financed entirely from state and local funds.

Effect of 1956 and 1957 Amendments

10. *How did the 1956 and 1957 Social Security Amendments affect federal aid to state public assistance programs?*

Prior to July 1, 1957, federal participation was based on the total amount of state assistance, including both money and vendor payments, within specified limits on each individual's monthly grant. In aid to the aged, the blind, and the disabled, only $60 of each recipient's grant was considered in calculating federal reimbursement; in aid to dependent children, the maximums were $32 each for one dependent child and the adult with whom he lived, plus $23 per month for each additional dependent child in the same family. (These amounts will be referred to in the rest of this report as the "basic grant.")

Since July 1, 1957, a state may choose to continue using this formula and to include vendor payments for medical services within these basic grants, or it may choose to change to the new federal aid formula applicable under the $6-and-$3 medical care amendments, with the basic grants limited to money payments.

11. *What effect does the new formula have on state public assistance financing?*

The basic effect is that more federal funds are made available for matching state assistance expenditures, and the legal maximums for federal reimbursement per assistance recipient are increased —but only if a state makes vendor payments for medical care as part of its public assistance program.

12. *If a state decides to use the $6-and-$3 reimbursement formula, what limitations will this place on over-all payment methods?*

Any vendor payments for medical care not contained within the $6 and $3 maximums will be ineligible for federal reimbursement, and, within the $60 and $32-32-23 (ADC) basic grants, only money payments will be eligible for federal reimbursement. Any payments not meeting these specifications must be financed entirely from state and local funds.

13. *What problem does this new formula raise for the states?*

Prior to July 1, 1957, some states already made public assistance payments, including money or vendor payments for medical services, which exceeded the basic grants eligible for federal aid. To continue at this level of expenditure under the older formula would be, for these states, to refuse additional federal funds now made available.

Too, some of these states were making medical care vendor payments which averaged more than $6 per adult and $3 per child. The new formula would, therefore, reduce the amount of support available for vendor payments. To obtain the largest possible amount of federal aid, it might be necessary for these states to change their method of payment for some items of medical service.

14. *How would these high-payment states be affected, in terms of federal funds received?*

As an example, consider a state which paid out $66 for each Old Age Assistance recipient. Prior to July 1, 1957, only $60 of this amount would be eligible for federal matching; the amount of federal reimbursement would be $39, whether the $60 was all in the form of a money payment or was part money and part vendor payment.

After July 1, 1957, if the state operated under the new formula, it would be eligible for $39 reimbursement on the $60, if the $60 were all in the form of a money payment to the recipient, plus $3 (50%) reimbursement of the other $6, if the $6 were all in the form of vendor payments for medical services (total, $42).

Under such a system, where the state receives the maximum amount of federal aid possible, federal reimbursement would increase $3 per recipient per month after July 1. (In Massachusetts, for instance, this would mean an increase of about 3 million dollars per year for OAA recipients alone.)

If, however, the state's $66 payment consisted of a $56 money payment and a $10 vendor payment, federal reimbursement would amount to $37 (on the $56 money payment) plus $3 (the maximum federal contribution to the vendor payment). In this case, federal reimbursement would total $40—an increase of only $1 per recipient over the old formula.

The foregoing examples simplify federal reimbursement formulas to illustrate how federal aid changes with the distribution of grants between vendor and money payments. In practice, of course, matching maximums for the money payments are applied to individual grants, while those for vendor payments are applied to the three-months total of assistance recipients and medical expenditures.)

15. *How have individual programs been affected?*

In order to obtain the additional federal aid n available, some of the high-payment states ha revised one or more of their public assistance p grams to bring the average vendor payment medical services as close as possible to the limit $6 per adult and $3 per child and to bring more the remaining medical care cost into the mon payment. Under the new formula, any vendor pa ments above the $6-$3 level are made without fe eral reimbursement.

16. *Are all states affected in this way by the n formula?*

No, the new formula creates problems primari for the high-payment states. Many states have be making total assistance payments of less than $ per person; these states would have to increa their payments before the new formula would fect their financing. States whose vendor paymen averaged less than $6 and $3 before July 1 also c obtain maximum federal aid without revising pa ment methods. In some states, these earmark funds for medical care have encouraged the initi tion of medical care plans where no such form program existed previously.

17. *Why do the high-payment states object curtailing vendor payments?*

Some providers of medical services in these stat object, because they feel that payment is less ce tain and the administrative burden on them great when they must collect from the individual assis ance recipient rather than from the state. Som state welfare agencies also object, because they ma be able to obtain reduced rates for medical servic reimbursed through a vendor payment arrang ment; this advantage is lost when services are pai for by the individual patient.

In addition, some welfare agencies have had diff culty in finding an item or a combination of items medical service which can be adequately finance within the $6 and $3 limits. For example, one stat has transferred infirmary care from vendor paymen to its money payments because the $6 vendor pay ment would cover only a fraction of the cost.

On the other hand, the matchable maximum fo federal participation in money payments is applie to each individual's grant rather than to an averag of all grants. This method, therefore, does not allow distribution of large medical costs throughout public assistance program, as does the vendor pay ment method. Any medical expenditures not cov ered by vendor payments which exceed the basic grant amounts must be paid entirely from state and local funds, so that transferring a service from ve dor to money payment may mean a loss of feder funds on expensive cases.

18. *What alternative methods have the states proposed?*

Several states have attempted to set up plans under which medical services for assistance recipients would be paid for through vendor payments, up to the $6-and-$3 limits, with any costs beyond this limit paid through additions to the patient's money payment. This use of the split-payment method was intended to assure providers of medical services that as much as possible of their bills would be paid to them directly by the agency and to effect some distribution of the larger cost items.

19. *Have any such plans been put into operation?*

Not as part of a public assistance program. The Bureau of Public Assistance has not authorized federal reimbursement in programs which propose the use of money payments to supplement vendor payments in this fashion, holding them to be inconsistent with present legislation.

Reasons for Policy

20. *Why does the Bureau of Public Assistance oppose split payments?*

The bureau gives three main reasons for its decision: (1) the intent of Congress and the content of the law; (2) the principles governing money payments; and (3) the principles of efficient administration.

21. *What conflict is there between existing laws and a split-payment method?*

Split payments are not specifically mentioned in the enabling legislation for public assistance medical care. However, in states which choose the new formula, the federal government will participate in vendor medical payments only within the $6 and $3 maximums. According to established practice in public assistance programs, these states must specify the items of service for which they will make vendor payments and may not apply them generally for any medical needs which arise.

22. *Why is it believed that split payments conflict with the intent of Congress?*

When the new $6-and-$3 formula was first enacted in 1956, it was to apply in all states, without exception, on July 1, 1957. After that date, federal reimbursement beyond those maximums would be confined to money payments.

In 1957, two types of amendments were introduced. The type passed by Congress allows each state to choose between the new formula and the formula in effect before July 1; the other type, which was not passed, would also allow the states the alternative of receiving federal reimbursement on vendor payments both under the $6-and-$3 formula and as part of the basic assistance grant.

Since Congress chose the amendment which limited the flexibility allowed the states in apportioning public assistance funds between vendor and money payments, if they wanted maximum federal participation in the costs, the Bureau of Public Assistance has been advised that split payments would be contrary to the intent of Congress.

23. *Would allowing split payments increase the federal share of public assistance costs?*

Probably. Since the states would be able to use both the money and vendor payment parts of the formula to more nearly maximum advantage, the high-payment states especially could more easily obtain federal matching up to the full $66 combined maximum.

24. *How do split payments conflict with general principles governing money payments?*

Public assistance policy is that the state, in making a vendor payment, is purchasing medical services on behalf of the assistance recipient; the state takes the responsibility for providing services and making payment. When it increases the assistance recipient's money payment to meet medical costs, the patient has full responsibility for spending the money, just as he is responsible for the purchase of other budget items, such as food and clothing. Money payments cannot be "earmarked" for specific purposes, but must be based on monthly over-all needs, with the recipient free to spend the grant as he sees fit. The Bureau of Public Assistance does not believe that these two types of responsibility can properly be combined, with the recipient paying part of the cost and the agency paying the remainder.

25. *How would split payments affect efficiency of administration?*

In a vendor payment system, the welfare agency not only makes payments but also arranges and maintains satisfactory working arrangements with the suppliers of medical services. If each medical cost were divided between money and vendor payments, providers of services would not be sure whether payment was to come from the individual, the agency, or both. The bureau feels this would not be consistent with efficient administration, because of the difficulty of maintaining satisfactory relationships with providers of services and because of the complex fiscal controls which would be necessary.

Future Possibilities

26. *Is legislation to allow split payments likely?*

Congress might give the Bureau of Public Assistance specific legal authority to allow split payments. However, the states suggesting this method did so only as a less drastic alternative to the strict division into money and vendor payments allowed under the new formula. New bills, therefore, are more likely to follow the lines of the 1957 Douglas-McCormack bills, to allow more flexibility in apportioning public assistance funds between the money and vendor payment or to increase the vendor payment medical care reimbursement available under the new formula to a level more consistent with the services and costs in the high-payment states.

MEDICINE AND THE LAW

SEQUEL TO HALL v. DE SAUSSURE

The "Medicolegal Abstracts," which appear in these columns at frequent intervals, are condensations of reported decisions of courts of appeal. However, the published decision of a court of appeal is not necessarily indicative of the final outcome of the case.

In *Hall* v. *DeSaussure*, 297 S.W. (2d) 81 (Tenn., 1956), abstracted in THE JOURNAL of July 6, 1957, page 1152, and discussed in the issue of Jan. 11, 1958, page 162, the trial court directed a verdict in favor of the defendant physician which was reversed on appeal. The trial court had refused to submit the case to the jury on the ground that the action had been barred by the statute of limitation. The higher court held that the case should have been submitted to the jury on the basis of the plaintiff's evidence that the defendant physician had fraudulently concealed the plaintiff's cause of action. Accordingly, the court held that the defendant's concealment prevented the running of the statute of limitation, and therefore the case was remanded for a new trial.

The background of the case and résumé of the second trial of the case has been supplied to the A. M. A. Law Department by Dr. Richard L. DeSaussure, the defendant. He states:

> Upon the first trial of this case in the Circuit Court of Shelby County, Tennessee, the Trial Judge granted a general motion for a directed verdict in favor of the defendant. The plaintiff appealed.
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> The action was for damages for breach of contract. Plaintiff alleged that her husband in his lifetime entered into a contract with the defendant, a neurosurgeon, Dr. Richard L. DeSaussure, for the performance of a rhizotomy. The suit was filed by William G. Hall in his lifetime. Shortly after the filing of the suit plantiff died and the cause was revived in the name of Mrs. Janice Hall, executrix. Plaintiff alleged in his declaration:
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> "On August 15, 1952, the plaintiff, in the office of the defendant, there being no one present except the plaintiff, the plaintiff's wife and the defendant, was advised by the defendant that he, the defendant, would recommend what he termed a rhizotomy, which defendant described to the plaintiff as being a very simple operation, consisting of a clipping or severance of the nerves leading through the pain area, by making an incision on the left side parallel to ar approximately an inch and a half from the spine, tl operation to be performed under a local anaesthetic. . . With the understanding that the plaintiff would allo no surgery of any kind or character upon his spine, ar upon the assurance by the defendant that no spinal surge would be performed, the plaintiff then entered into a co tract with the defendant to perform the operation herei above described, and no other.
>
> "Thereafter, on September 8, 1952, the plaintiff, in tl Baptist Memorial Hospital, Memphis, Tennessee, pursua to said contract, submitted to an operation at the hands defendant.
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> "After the operation, plaintiff continued to suffer excr ciating pain, with the exception of a very short period time immediately following the operation, and plaintil shoulder and arm became locked, and although physiothe apy was resorted to, the locking or stiffening of the plaintil shoulder increased and the arm began to atrophy and t pain became so intolerable that plaintiff was forced to resc to the use of codeine in heavy quantities." (R. 4-7.)

The plaintiff testified that instead of the oper tion being performed in accordance with the cc tract the defendant entered his spine by means a laminectomy and severed the nerve roots.

> At the conclusion of the defendant's evidence on the f trial of the case a general motion for a directed verd made on behalf of Dr. Richard L. DeSaussure was grant and plaintiff's suit was dismissed.
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> Upon appeal, the Court of Appeals held that there v evidence to take the case to the jury on the issue of liabil and also upon the issue of fraudulent concealment of cause of action by the defendant, the defendant having p the one year statute of limitations.
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> Upon a remand of the case all issues were submitted the jury and the jury, with unusual dispatch, returnec verdict for the defendant, Dr. Richard L. DeSaussure.
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> Although the decedent, the original plaintiff, had alle that the contract sued on was entered into on August 1952, decedent's wife, in whose name the action was vived, admitted on cross-examination that no decision have the operation performed was reached on August 1952 but that she and her husband left the office of DeSaussure on that date without agreeing to have the ope tion performed; that thereafter on September 2, 1952, t returned to his office, discussed the matter further, and a advising with their regular physician, Dr. Duane Carr, de mined to have the rhizotomy performed.
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> Dr. DeSaussure testified upon the second trial (he hac opportunity to testify on the first trial because plaintiff's was dismissed at the close of plaintiff's evidence)

> plaintiff's decedent and his wife came to his office on August 15, 1952, at which time he explained to them several possible operative procedures that might be considered but stated in his opinion that only a rhizotomy would give the plaintiff relief from the intense pain he was suffering.
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> It appeared without dispute that on May 23, 1952, Dr. Duane Carr had operated upon decedent, performing a left upper lobe lobectomy, removal of the third and fourth ribs and had incised the second, third and fourth intercostal nerves. A portion of the malignant tumor could not be reached by surgery. It was after this operation that the decedent first called on Dr. DeSaussure.
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> Both decedent's wife and Dr. DeSaussure testified that after the decedent and his wife had first conferred with Dr. DeSaussure, they were unwilling to have the rhizotomy performed without consulting with Dr. Duane Carr, the physician who had performed the operation on May 23, 1952.
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> Decedent's wife testified that she and decedent went to Dr. Carr's office on September 2, 1952, discussed the matter at length, and upon Dr. Carr's recommendation determined to have the rhizotomy performed. On September 8, 1952, the rhizotomy was performed by Dr. Richard L. DeSaussure by removing the laminae and severing the nerve roots leading into the pain area.
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> On January 13, 1954, William G. Hall, the patient, and referred to here as decedent, filed this suit against Dr. Richard L. DeSaussure. Mr. Hall died on January 25, 1954, and it was then that the suit was revived in the name of his widow, Mrs. Janice Hall, as Executrix.
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> Dr. Duane Carr testified that at the time of the conference on September 2, 1952, he explained to Mr. and Mrs. Hall the nature of the rhizotomy operation and that they understood that a laminectomy would have to be performed in order to reach the nerve roots and it was after having this explanation made that Mr. and Mrs. Hall returned to the defendant's office and made final arrangements for the operation.
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> The Trial Court condensed the issue of liability presented by the declaration to the sole question of whether or not the defendant had committed an assault and battery on decedent by performing the operation differently from the manner agreed upon. There were no questions of negligence or malpractice in the case. The issue of alleged fraudulent concealment of the cause of action by the defendant was also submitted to the jury. There was no evidence of fraudulent concealment unless the nebulous excerpt from the record quoted by the Court of Appeals upon the first appeal could be so considered.
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> As stated previously, the jury returned a verdict for Dr. Richard L. DeSaussure on all issues. No appeal was prayed and the judgment in favor of Dr. DeSaussure is final."

In a letter to the Law Department, Dr. DeSaussure stated that he had made a complete explanation of the nature of the operation to the patient and that the litigation was probably the result of a careless remark made by another physician. His letter states:

> I should like to comment on your "Fraudulent Concealment of a Patient's Cause of Action," which appeared in the J. A. M. A. January 11, 1958 issue, since I was the defendant in the law suit to which you referred (Hall vs. DeSaussure, 297 S. W. (2) 81 (1956).
>
> In your last paragraph you state that the unfortunate thing is that a timely and logical explanation had not been given the patient. These, however, are not the facts. It is true that this is what both the plaintiff and his wife said, but it is a well-known fact that patients do not always quote their doctors correctly.
>
> I should be glad to discuss this at some length if you desire, but briefly this man first attempted to bring suit on the basis that I had given him cancer. When a review of the records demonstrated that he had cancer and had been told by his chest surgeon that he had a residual growth, prior to the time I saw him, he sought some other reason for bringing suit.
>
> Prior to surgery, I had discussed prefrontal lobotomy, rhizotomy, cordotomy and section of peripheral nerve with this man at great length since he was a lawyer and I thought had more intelligence than the average patient. Rhizotomy was decided upon. The fact, that these were discussed with him, were brought out at the subsequent trial by Dr. Duane Carr and by Dr. Gwin Robbins, chest surgeons, who referred the patient to me. This man's suit was brought when he was terminal.
>
> As you noted, the court of appeals returned this case for trial before a jury. The jury deliberated only ten minutes before returning a verdict in my favor.
>
> In the original trial, my lawyer and I discussed at some length as to whether to try the case fully on its merits, or to cut the case short in order to save time and ask for directed verdict on the statute of limitation. We felt this was a valid argument and therefore tried to win the case on the basis of the statute of limitation. As you know, this was not successful, but we did win the case subsequently on the basis of its merits.
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> Rather than an example of not explaining things to the patient fully, which I can assure you I did, I feel that this is a better example of how an unthinking exclamation by one of our colleagues can result in a law suit. To wit, the exclamation, "he sure took a chunk out of your spine," which I feel was directly responsible for the case.

In the foreword to "Medicolegal Forms with Legal Analysis," a compendium of operative and other consent forms, the statement is made:

> In the absence of a consent form that describes within reasonable latitude the nature of the operation or treatment to be performed, a jury can very easily choose to believe the "forgetful" patient whose recollection regarding the treatment he authorized has been dimmed by time or circumstances.

Fortunately the jury chose to believe that Dr. DeSaussure had made an adequate explanation of the procedure to be performed and the possible results. However, it is possible that a consent form setting forth the nature of the operation and its risks, executed by the patient (an intelligent lawyer), might have discouraged the filing of the suit.

Single copies of "Medicolegal Forms with Legal Analysis" are available to physicians without charge. Requests should be sent to the American Medical Association, Law Department, 535 N. Dearborn St., Chicago 10. A charge of $1.00 per copy is made to nonphysicians.

MEDICAL NEWS

ALABAMA

State Medical Elections.—The Medical Association of The State of Alabama has installed the following officers: president, Dr. Edgar G. Givhan Jr., Birmingham; president-elect, Dr. William R. Carter, Repton; vice-president, Northeastern Division, Dr. William E. White, Anniston; state board of censors, Dr. Wilmot S. Littlejohn, Birmingham, to fill one-year term, Dr. Justus M. Barnes, Montgomery, five-year term, and Dr. James O. Finney, Gadsden, who succeeded himself for a five-year term.

Specialty groups that elected officers during the annual session included: Alabama Association of Obstetricians and Gynecologists, president, Dr. Julian P. Hardy, Birmingham; vice-president, Dr. Theodore F. Middleton, Mobile; and secretary-treasurer, Dr. H. Lyman Findley Jr., Tuscaloosa.—Alabama Orthopaedic Society, president, Dr. John F. Comer, Birmingham; vice-president, Dr. Alfred R. Earl, Mobile; secretary-treasurer, Dr. Paul D. Everest, Montgomery.—Alabama Chapter, American College of Chest Physicians, president, Dr. Arthur A. Calix, Decatur; vice-president, Dr. Justus M. Barnes, Montgomery; secretary-treasurer, Dr. William J. Tally, Gadsden.—Alabama Pediatric Society, president, Dr. Jerome A. Weaver, Birmingham; president-elect, Dr. Robert O. Harris, III, Mobile; secretary-treasurer, Dr. Joseph M. Humphries, Birmingham.—Alabama Society of Anesthesiologists, president, Dr. Robert Nelson Jr., Tuscaloosa, and secretary-treasurer, Dr. Hal D. Broadhead, Montgomery.

CALIFORNIA

Lecture on Heart Pump Surgery.—Experiences with open heart pump surgery will be discussed by Dr. Alexander S. Nadas, Boston, at a professional meeting sponsored by the Los Angeles County Heart Association, in cooperation with UCLA and Childrens Hospital, in the Santa Anita Research Building Auditorium, Childrens Hospital, May 23, 8 p. m. A graduate of the Budapest Medical School, Dr. Nadas was a Fulbright Professor at the University of Gronigen, Netherlands, in 1956 and is now physician and cardiologist at the Children's Medical Center in Boston.

Personal.—The Foundation of the American Society of Plastic and Reconstructive Surgery has announced that Dr. Bernard G. Sarnat, of Beverly Hills, is the recipient of its 1957 senior award for research in plastic and reconstructive surgery. He is the only winner of both the junior and senior awards, the former in 1950.——The annual American Academy of Neurological Surgery award was won by Dr. Byron C. Pevehouse, of San Francisco, whose paper was entitled "Observations on Methods of Induced Hypotension and Hypothermia in the Rhesus Monkey."——The appointment of Dr. James F. Regan to the California State Board of Medical Examiners has been announced by Governor Goodwin J. Knight. Dr. Regan succeeds Dr. William F. Quinn, Los Angeles County Medical Association secretary-treasurer, who served three consecutive terms on the board.

Symposiums on Hematology and Tissue Transplantation.—To celebrate the opening of new research facilities of the Palo Alto Medical Research Foundation, two symposiums, "Hematology" and "Tissue Transplantation," will be presented by the Palo Alto Medical Clinic and the foundation May 17 in the auditorium of the Palo Alto Medical Clinic. The hematology conference will include the following:

Distribution of Human Blood Groups in Health and Disease, Dr. William P. Creger, San Francisco.
Blood, Iron and Isotopes, Dr. Joseph F. Ross, Los Angeles
Iron Metabolism, Dr. Myron Pollycove, Berkeley, Calif.
Bone Marrow Hemosiderin, Dr. Ralph O. Wallerstein, San Francisco.
Surgery in Patients with Blood Dyscrasias, Dr. Roy B. Cohn, San Francisco.

Studies on tissue transplantation will include "Hemotransplantation of Human Tissue; Present Status and Goals," by Dr. John P. Merrill, Boston. A panel discussion on renal transplantation will precede the dedication ceremonies at which Dr. John R. Heller, assistant surgeon general, U. S. Public Health Service, will present the dedication address

CONNECTICUT

Announce Student Fellowships.—Dr. Vernon W. Lippard, dean, Yale School of Medicine, New Haven, has announced the award of four fellowships for advanced study and research in European laboratories and a fifth for a year of research at Yale. The five students and their place of study are:

Donald Kent Morest, of Mission, Kan., awarded a James Hudson Brown Memorial Fellowship for research on "Rostral Projections from the Area Postrema of the Brain," under Professor Guillery in the Department of Anatomy of the University College, London, England.
Alan Finkelstein, of Pittsburgh, awarded a National Institutes of Health Fellowship for research on "Properties of

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

Fixed-Charged Membranes," under Prof. Torsten Teorell at Uppsala University, Uppsala, Sweden.

Shaun Joseph Ruddy, of Ansonia, Conn., awarded a National Institutes of Health Fellowship for research on "Immune Adherence," under Professor Grabar at the Pasteur Institute, Paris, France.

Walter John Hierholzer Jr., of Midland, Mich., awarded a Fulbright Fellowship for research on "Activation of Fibrinolytic Systems by Staphylokinase," under Prof. Tage Astrup at the Biological Institute of the Carlsberg Foundation, Copenhagen, Denmark.

Frank Howard Baker, of Hartford, Conn., awarded a James Hudson Brown Memorial Fellowship for research on "The Application of Information Theory to the Study of a Nervous Reflex." Mr. Baker will work in the departments of physiology, physics and electrical engineering at Yale during the period of his fellowship.

Each of the fellowships provide about $3,000 to cover expenses and the five students receiving the awards will interrupt their regular medical course in 1958-1959 for a special work. Funds for the fellowships and for 75 summer scholarships of $500 awarded to Yale medical students in support of original research have been provided by the James Hudson Brown Memorial Fund at Yale, the Fulbright awards, the National Science Foundation, the National Institutes of Health, the Foundations Fund for Research in Psychiatry, the Lederle Laboratories, the Josiah Macy Foundation, the Tobacco Research Foundation, and the National Foundation for Infantile Paralysis.

FLORIDA

Annual Rowntree Lecture.—Dr. Robert M. Kark, professor of medicine, University of Illinois College of Medicine, Chicago, will give the second annual Leonard Rowntree Lecture at the University of Miami School of Medicine, Coral Gables, May 23. The lecture, sponsored by Phi Beta Pi medical fraternity, will be on the subject of "Richard Bright and Bright's Disease."

GEORGIA

Organize Former Members of Grady Hospital Staff.—An organization is being formed of all former members of the house staff of Grady Memorial Hospital, Atlanta. Two years ago letters were sent to all known former house officers. However, many names were not included because of an incomplete mailing list. All former staff members are requested to send their name, address, and dates served at Grady. Plans are being made for a first annual meeting next fall. Send data to Grady Hospital Clinical Society, Office: G-610, 80 Butler St., S. E., Atlanta, Ga.

ILLINOIS

Annual State Surgical Meeting.—The annual clinical and scientific meeting of the Illinois Surgical Society will be held May 19 at the Cook County Hospital. Dr. Raymond W. McNealy will serve as chairman of the surgical symposium, to include the following topics: Fluids and Electrolytes, Gastrectomy, Unusual Surgical Cases, Hand Clinic, Open Reduction of Fractures, Carcinoma of the Lung, Sigmoid Resection, Vaginal Hysterectomy, Injuries to Urinary System, Carcinoma of the Breast, Split-Thickness Skin Grafts, Obstructive Jaundice, Chronic Relapsing Pancreatitis, Mitral Commissurotomy, Colon Surgery, and Arterial Transplantation for Obstruction. At the evening session (at the University Club), Dr. John H. Garlock, New York City, will present "Problem of Therapy for Regional Enteritis." The medical profession is invited. For information write the Illinois Surgical Society, Inc., suite 1421, 122 S. Michigan Ave., Chicago 3.

Pathologists Meeting in Chicago.—A joint meeting of the Illinois Society of Pathologists, Illinois Association of Blood Banks, North Central Region of the College of American Pathologists, and the Section on Pathology of the Illinois State Medical Society will be held May 23 at the Hotel Sherman, Chicago. Preceding the meeting (May 22), Dr. Oscar B. Hunter Jr., president, American Association of Blood Banks, will address the general assembly, on "Radioisotopes as Practical Diagnostic Aids." The program includes the following:

ABC's of Isotopes in Medicine, Dr. Austin M. Brues, Chicago.
A. E. C. and Economic Requirements for an Isotope Laboratory, Donalee L. Tabern, Ph.D., North Chicago, Ill.
The Pathologist and the Isotope Laboratory, Dr. Hunter.
Role of a Blook Bank in an Isotope Laboratory, Dr. Hunter.
Methodology and Demonstrations of Radioisotopes, Dr. Tabern.

Question-and-answer periods will follow. Members and guests are invited to the luncheon of the Illinois society at noon. For information write the Illinois Society of Pathologists, 1439 S. Michigan Ave., Chicago 5.

Chicago

Hoffman Research Fellowship.—Dr. Samuel J. Hoffman, executive director, Hektoen Institute for Medical Research of the Cook County Hospital, will be honored on the 15th anniversary of the institute May 17, 7 p. m., at the Drake Hotel, when a group of doctors and civic leaders will present a research fellowship to the institute in his name. Dr. Karl A. Meyer and Mr. Daniel B. Ryan, honorary chairman of the fellowship committee, will present a scroll to Dr. Hoffman at the celebration dinner.

KANSAS

Award from Blind Veterans.—The Blinded Veterans Association has presented its "Employer of the Year" award to the Wichita Clinic, a private medical center in Wichita, Kan., in recognition of its policy of utilizing the skills of blind workers. Maj. Gen. Melvin J. Maas, chairman, President's Committee on Employment of the Physically Handicapped and a member of the BVA board of directors, who made the presentation, pointed out that a totally blind woman was hired by the clinic as an x-ray film developer and was subsequently given training for x-ray technician. Another blind girl was hired as a dictation machine transcriber typing highly technical medical case reports. The "Employer of the Year" award was established by the Blinded Veterans Association in 1949 "as a means of giving merited recognition each year to those employers who have realized that qualified blind workers make capable and efficient employees."

KENTUCKY

Grants for Kidney Research.—The U. S. Public Health Service has granted a total of $90,000 for a three years' research project on kidneys at the University of Louisville Medical School. Dr. Peter K. Knoefel, chairman of the department of pharmacology, who will head the project, says the U. S. grant will enable him to continue basic research in this subject started several years ago. An Eastman Kodak grant of about $12,000 a year for this and related projects has financed the work in the past and will continue. Grants from the various heart associations have also contributed.

Outstanding Citizen Award.—Dr. J. Farra Van Meter was awarded the Lexington Optimist Club cup as Lexington's "Outstanding Citizen of 1957" at ceremonies on March 7. Dr. Van Meter, a past-president of the Fayette County Medical Society, was selected to be the 31st recipient of the cup on the basis of his "civic service, church and religious activities, professional standing, and personal life." He is on the Board of the Kentucky Medical Foundation and is active in Lexington's United Community Services, the YMCA, Kiwanis, and religious organizations. In 1957, he was given a special award for his work in the Kentucky division, American Cancer Society.

LOUISIANA

Dr. Farber Receives Award.—The second annual award of the American Society for Experimental Pathology "for distinguished medical research" has been presented to Dr. Emmanuel Farber, associate professor of pathology and biochemistry, Tulane University School of Medicine, New Orleans. The award, accompanied by a medallion and a $1,000 honorarium contributed by Parke–Davis, was established by the society to encourage young pathologists in scientific research. Nominees must be no more than 40 years of age. The work for which Dr. Farber was cited explores chemical changes in cells as a cause and basis of disease. Dr. Farber who was born in Canada became a naturalized U. S. citizen in 1956. He studied at the University of Toronto and the Graduate School of the University of California, and was trained at Hamilton General Hospital, Hamilton, Ontario, the University of California, Cook County Hospital in Chicago, and Tulane University.

Plan Research Building at Tulane.—Tulane University has announced that its School of Medicine will build a new building to provide for continued expansion of its research and teaching programs and that a grant for research facilities of $1,500,000 has been awarded toward the cost of the building by the U. S. Department of Health, Education and Welfare. The size of the planned addition, (225,000 square feet, doubling the present floor space) was decided upon after study of medical building needs for the next 15 years. Dr. Maxwell E. Lapham, dean, pointed out that medical research grants had grown from $249,145 in 1947 to $1,526,751 in 1957 and that registrants in the division of graduate medicine had increased from 76 in 1932 to 459 in 1957. The new building will help solve overcrowding, provide more student study space, allow for expansion of the Rudolph Matas Medical Library, and provide for unification of the Medical School in one location adjacent to Charity Hospital of Louisiana at New Orleans. Funds totaling 16 million dollars to pay the cost of the new facility plus renovating the present building and endowment for maintenance will be raised as part of a university 10-year program seeking 96 million dollars to be divided among general endowment for the university, a new science building, and a new law school building and maintenance of these, plus the medical school program.

MASSACHUSETTS

State Medical Meeting in Boston.—The 177th anniversary of the Massachusetts Medical Society will be celebrated May 20-22 at the Hotel Statler, Boston. Dr. Edward D. Churchill, John Homans Professor of Surgery, Harvard University, Boston, will present the Annual Discourse May 20. The following panel discussions and moderators are scheduled:

Functional Uterine Bleeding, Dr. Howard Ulfelder, Boston.
Trauma to the Hand, Dr. J. Edward Flynn, Boston.
Management of Cancers That You Can See; Dr. Grantley W. Taylor, Boston.
Highway Safety—A New Challenge to Preventive Medicine. Mr. Ross A. McFarland, director, Commission on Accidental Trauma, Armed Forces Epidemiological Board, Department of Defense.
Present-Day Management of Tuberculosis, Dr. Kenneth T. Bird, Boston.

The Shattuck Lecture, "Role of Endogenous Pyrogen in the Genesis of Fever," will be given by Dr. William B. Wood Jr., Baltimore. A cineclinic, "A Child Alone," will be held May 20, with Dr. Thomas A. Kelley as chairman. Scientific exhibits, an art exhibition, and a meeting of the Massachusetts Medical Legal Society (May 21) are planned. Entertainment includes the annual golf tournament and the annual dinner, at which Paul C. Reardon, chief justice, The Superior Court of the Commonwealth of Massachusetts, will be the guest speaker.

MICHIGAN

Establish Third Cortisone Bank.—Lansing is the third city in Michigan to have a cortisone and allied blood bank. The other two are in Detroit and Ann Arbor. Established at Edward W. Sparrow Hospital under the auspices of the Michigan Chapter of the National Nephrosis Foundation, the bank will serve patients who are suffering from nephrosis or allied kidney disorders. Families within the Ingham county area will benefit by receiving drugs without charge and repaying the foundation as they are able. Drugs will be dispensed by the hospital pharmacy to patients with a prescription from a physician. Beta Sigma Phi Sorority of Lansing volunteered to support the project.

Rabies in Wildlife.—Two cases of rabies in animals have been reported recently around the Sault Ste. Marie area. The first case was in an unvaccinated domestic cat, which bit a 12-year-old boy who is receiving the Pasteur series of anti-rabies injections. The second case was that of a wild fox that attacked a dog tied to a kennel at the Camp Lucas radar station. Up to April 8, Michigan had recorded two other rabies cases, making a total of four for the year. The third case was a wild skunk, killed as it attacked a farmer while he was working in his barn near Harbor Beach. The fourth case involved an unvaccinated hunting dog that died when its owner brought it home to Detroit after boarding it for several months at a kennel in southern Ohio. The Ohio county where the kennel is located has reported eight animal rabies cases and one human rabies death so far in 1958.

MINNESOTA

Annual State Meeting in Minneapolis.—The 105th annual meeting of the Minnesota State Medical Association will be held May 22-24 at the Hotel Leamington, Minneapolis. Dr. Richard H. Chamberlain, Philadelphia, will present the Russell D. Carman Memorial Lecture on "Radiation Hazards in Clinical Medicine." Dr. William Boyd, Toronto, Ontario, Canada, will give "The Spontaneous Regression of Cancer" as the Arthur H. Sanford Lecture in Clinical Pathology. Seven panel discussions are scheduled: Emergencies, the Family Doctor's Responsibility to His Preschool Eye Patient, What's New in Dermatology, Surgery, Viruses and Virus Diseases, Mental Health, and Medico-Legal Aspects of Heart Diseases. The program includes 15 roundtable discussions and the following topics by out-of-state speakers:

The Obstetrician's Role in Perinatal Mortality, Dr. John S. Gillam, Fargo, N. D.
Diagnosis and Management of Eye Problems, Dr. Marshall M. Parks, Washington, D. C.
Inguinal and Femoral Hernioplasty, Dr. Chester B. McVay, Yankton, S. D.
Obstetric Manikin Demonstration, Dr. Gillam.
Physicians' Feelings, Dr. William C. Menninger, Topeka, Kan.

Dr. Leroy E. Burney, Surgeon General, U. S. Public Health Service, will present a discussion following an address by Dr. Marcolino G. Candau, director-general, World Health Organization, Geneva, Switzerland. At the annual banquet May 23, Dr. H. B. Sweetser, president of the association, will present an address after which Dr. David B. Allman, President of the American Medical Association, will give the annual banquet speech. For information write Mr. R. R. Rosell, 496 Lowry Medical Arts Building, St. Paul 2, Minn.

NEW JERSEY

State Medical Meeting in Atlantic City.—The 192nd annual meeting of the Medcial Society of New Jersey will be held May 17-21 at Haddon Hall, Atlantic City. Over 70 papers and the following symposiums and moderators are scheduled at the 20 section meetings:

Bleeding Factors Relating to Obstetrical and Gynecological Patients: (1) Hemologic Aspects, Dr. John W. Frost, Philadelphia; (2) Obstetrical Aspects, Dr. Robert C. McElroy, Philadelphia; (3) Gynecological Aspects, Dr. Hammell P. Shipps, Camden.
Rheumatoid Arthritis of the Foot: (1) Medical Aspect, Dr. L. Maxwell Lockie, Buffalo; (2) Rehabilitation, Dr. Henry H. Kessler, Newark; (3) Orthopedic Devices for the Shoe, Mr. William Locasio, New York City.
Experience With Various Methods of Urinary Diversion, Drs. Willet F. Whitmore Jr., New York City, and George T. Whittle, Asbury Park.

Dr. David B. Allman, President, American Medical Association, will serve as toastmaster at the dinner-dance May 20, 7 p. m. For information write Mr. Richard I. Nevin, 315 W. State St., Trenton 8, N. J.

NEW YORK

Establish Epidemiology Department.—The Chronic Disease Research Institute of the University of Buffalo has established a department of epidemiology under the direction of Dr. Warren Winkelstein Jr. This has been made possible by a Buswell Research Fellowship grant from the University of Buffalo and by support the institute receives from the State Department of Health. The department will undertake field studies of cardiovascular disease. Studies into the relationship of diet and blood pressure, and endocrine factors in coronary artery disease have been planned for the first phase of the operation.

Dr. Berg Named First Kaiser Professor.—Dr. Robert L. Berg, of Harvard Medical School, Boston, has been appointed the first Albert D. Kaiser Professor of Preventive Medicine and Community Health at

automotive exhaust problem, as well as the public relations aspects of effective air pollution control administration. For information write the Air Pollution Control Association, 4400 Fifth Ave., Pittsburgh 13.

Meeting of Laryngological Societies in San Francisco.—The 61st annual meeting of the American Laryngological, Rhinological and Otological Society, Inc. (May 21-23) and the 79th annual meeting of the American Laryngological Association (May 19-20) will be held at the Hotel Mark Hopkins and the Fairmont Hotel, San Francisco, respectively. The presidential address at the society meeting will be given by Dr. Lawrence R. Boies, Minneapolis, on "The Future of Otolaryngology—Six Years Later." Guest of honor will be Dr. Harold S. Diehl, dean of medical sciences, University of Minnesota, Minneapolis. Three symposiums with the following moderators are scheduled:

Reconstructive Nasal Surgery, Dr. William R. Taylor, Vancouver, B. C.
Modern Criteria for Diagnosis and Therapy of Malignant Disease in the Upper Respiratory Tract, Dr. Jerome A. Hilger, St. Paul.
Stapes Mobilization—Two Years Later, Dr. Howard P. House, Los Angeles.

Two motion pictures will be shown: "The Trans-Septal Intra-Nasal Dacryocystorhinostomy—A Neglected Operation" and "Combined Laryngectomy and Neck Dissection."

At the meeting of the association, the following papers will include invited guest authors:

Carcinoma-in-situ of the Larynx: A 10-Year Study of Its Histopathological Classification, Prognosis and Treatment, Drs. Alden H. Miller and Russel Fisher, Los Angeles.
Bronchoscopic Findings in Tuberculous Children—A 15 Years' Study, Drs. David E. S. Wishart and James B. Whaley, Toronto, Ont.
Physiology of the Larynx under Daily Stress (film), Drs. Paul G. Moore, Evanston, Ill., and Hans V. Von Leden, Chicago.

The associations' president's reception and annual dinner will be held the evening of May 19. An International Broncho-Esphagological dinner is scheduled for May 22, 7 p. m., at the Hotel Mark Hopkins.

Cardiology Meeting in St. Louis.—The seventh annual meeting of the American College of Cardiology will be held May 20-24 at the Chase–Park–Plaza Hotel, St. Louis. The convention guest lecture, "Long Term Use of Anticoagulants," will be presented by Dr. Irving S. Wright, New York City. Six symposiums are scheduled with the following moderators:

Infarction and Thromboembolism, Dr. Edward Massie, St. Louis.
Effect of Stress and Environment on Cardiac Function, Dr. Ernst Jokl, Lexington, Ky.
Myocardial Metabolism, Dr. Richard J. Bing, St. Louis.
Some Common Drugs Used in the Treatment of Heart Disease, Dr. John H. Moyer, Philadelphia.
Modern Management of Tetralogy of Fallot, Dr. J. Maxwell Chamberlain, New York City.
The Surgical Management of the Aortic Valve, Dr. Ivan D. Baronofsky, New York City.

The Groedel Memorial Lecture on Humanities in Medicine will be given May 22 by Dr. Paul R. Cannon, Chicago, on "The Changing Patterns of Disease." Fireside conferences, a ladies' program, and panel discussions are arranged. The seventh annual banquet will be held May 23, 7:30 p. m. Medical motion pictures and technical and scientific exhibits will be shown. For information write Dr. Philip Reichert, Secretary, American College of Cardiology, Empire State Building, New York 1.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

	April 19, 1958		April 20, 1957
Area	Paralytic Type	Total Cases	Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	..	..	..
Middle Atlantic States			
New York	..	1	1
New Jersey	..	..	..
Pennsylvania	..	..	..
East North Central States			
Ohio	..	..	..
Indiana	..	..	1
Illinois	..	..	..
Michigan	1	1	1
Wisconsin	..	..	1
West North Central States			
Minnesota	..	..	..
Iowa	..	..	..
Missouri	..	..	..
North Dakota	..	..	..
South Dakota	..	..	..
Nebraska	..	..	..
Kansas	..	..	..
South Atlantic States			
Delaware	..	..	..
Maryland	..	..	..
District of Columbia	..	..	..
Virginia	1	1	2
West Virginia	..	..	..
North Carolina	..	..	1
South Carolina	..	..	..
Georgia	..	..	1
Florida	..	1	1
East South Central States			
Kentucky	..	..	..
Tennessee	..	..	..
Alabama	..	1	..
Mississippi	..	..	1
West South Central States			
Arkansas	1	1	1
Louisiana	..	..	1
Oklahoma	..	..	..
Texas	1	1	5
Mountain States			
Montana	..	..	..
Idaho	..	..	..
Wyoming	..	..	..
Colorado	1	1	..
New Mexico	..	..	..
Arizona	..	..	2
Utah	..	..	..
Nevada	..	..	..
Pacific States			
Washington	..	2	..
Oregon	..	..	3
California	..	2	10
Territories and Possessions			
Alaska	..	..	..
Hawaii	..	..	..
Puerto Rico	2	2	..
Total	7	14	32

FOREIGN

Congress for Postgraduate Study in West Berlin.—The 7th Congress for Medical Postgraduate Study will be held in West Berlin from May 28 to June 1. At the opening ceremonies Prof. Dr. Hans Neuffer, president, Federal Chamber of Physicians of Germany, will talk on "The General Practitioner." The German Pharmaceutical Industry and Medical-Technical Industry will hold an exhibit. Congress topics include (May 28) "Vascular Diseases," (May 29) "Pediatrics," (May 30) "New Knowledge in the Field of Endocrinology and Its Importance for General Practice," (May 31) "Diseases of the Small and Large Intestine," and (June 1) "The Change of Disease Entities Under the Influence of Modern Therapeutic Substances." On May 29 a postgraduate course on cardiology will be held, concerned chiefly with the diagnosis of congenital and acquired heart disease. A program on "Foundations of Expert Testimony by Physicians" is planned. For information write Kongressgesellschaft fur arztliche Fortbildung e. V. Berlin-Steglitz, Klingsorstrasse 21, Germany.

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Written.* Various locations, July 17, 1959. Final date for filing application is January 17, 1959. Sec., Dr. Curtiss B. Hickcox, 217 Farmington Ave., Hartford, Conn.

American Board of Dermatology: *Written. Several Cities,* June 30. *Oral.* Detroit, Oct. 17-19. Final date for filing all applications is April 1. Sec., Dr. Beatrice Maher Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *Written.* Oct. 20, 1958. *Oral.* Philadelphia, April 23-26; San Francisco, June 18-21; Chicago, Oct. 13-16. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: Applications for certification, new and reopened, Part I, and requests for re-examination Part II, are now being accepted. All candidates are urged to make such application at the earliest possible date. Deadline date for receipt of application is September 1, 1958. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), January 1959. Final date for filing application is July 1, 1958. *Oral Examinations 1958* (Part II): San Francisco, June 17-21; Chicago, Oct. 17-22. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

American Board of Orthopaedic Surgery: *Part II.* Chicago, Jan. 21-23, 1959. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 6-9. Final date for filing application is March. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pathology: San Francisco, June 30-July 2. Final date for filing application is May 1. Sec., Dr. Edward B. Smith, Indiana University Medical Center, 1042-1232 W. Michigan St., Indianapolis 7.

American Board of Pediatrics: *Oral.* Atlantic City, May 3-5; Cincinnati, June 13-15; Chicago, Oct. 24-26 and New York, Dec. 5-7. Sec., Dr. John McK. Mitchell, 6 Cushman *Road, Rosemont, Pa.*

American Board of Physical Medicine and Rehabilitation: *Oral and Written.* Peoria, Ill., June 20-21. Final date for filing application was Feb. 1. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

American Board of Plastic Surgery: *Oral and Written.* Chicago, Oct. 9-11. Final date for receipt of case reports is July 1. Corresponding Secretary, Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

American Board of Preventive Medicine: *Occupational Medicine,* April 18-20. Final date for filing application was Jan. 30. *Public Health* on a Regional Basis, April. Final date for filing application is Jan. 30. Sec., Dr. Tom F. Whayne, 3438 Walnut St., Philadelphia 4.

American Board of Proctology: *Oral and Written, Parts I and II.* September 1958. Final date for filing application is March 15. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Special Examination in Nuclear Medicine for Diplomates in Radiology or Therapeutic Radiology,* Chicago, May 17. Deadline for filing application was Feb. 1. *Regular Examination in Radiology,* Chicago, May 19-23. Final date for filing application was Jan. 1. *Regular Examination in Radiology.* Washington, D. C., Dec. 8-12. Final date for filing application is July 1. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: *Oral (Part II).* Chicago, May 12-13; Los Angeles, June 16-17; Portland, June 20-21. Written examinations (Part I) will be held at various centers in the United States, Canada, Hawaii, Puerto Rico, and certain military centers abroad on December 3. The date of the Fall examination in *Part I* has been changed from the last Wednesday of October as announced in its current Booklet of Information to December 3, 1958. Thereafter, examinations in Part I will be held once annually, on the first Wednesday of December. The closing date for filing applications will be August 1. *Part II.* Baltimore, March 10-11. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: *Oral.* Boston, May 12-13. Final date for filing application was December 1. The fall written examination will be given in September 1958 and closing date for registration is July 1. Registration for the fall oral examination closes July 1.

DEATHS

Allen, Arthur Wilburn ⊕ Boston; born in McKinney, Ky., Nov. 30, 1887; Johns Hopkins University School of Medicine, Baltimore, 1913; formerly lecturer in surgery at Harvard Medical School; secretary of the Section on Surgery, General and Abdominal, of the American Medical Association from 1938 to 1941, when he became chairman, serving until 1942; past-president of the American College of Surgeons and from 1948 to 1951 chairman of the board of regents; served as president of the Boston Surgical Society, which awarded him the Bigelow Medal, Society of Vascular Surgery, Massachusetts Medical Society, and the Pan Pacific Surgical Society; member of the American Surgical Association, Southern Surgical Association, and the International Society of Surgeons; member of the founders group of the American Board of Surgery; honorary fellow of the Royal College of Surgeons and the Royal Society of Medicine in England; veteran of World War I; during World War II a member of the subcommittee on vascular injuries for the National Research Council; since 1953 president of the Boston Medical Library; a director of the Massachusetts Blue Cross Plan since 1949 and of the Blue Shield Plan from 1945 to 1953; a trustee of the Governor Dummer Academy in South Byfield; received an honorary doctor of science degree from Georgetown (Ky.) College in 1943 and Harvard in 1952; honorary surgeon and for many years associated with Massachusetts General Hospital, where he was chief of the East surgical service from 1936 to 1948, when he became consultant in surgery, and later was named a trustee of the hospital; died in the Phillips House of the Massachusetts General Hospital March 18, aged 70, of uremia.

Altemus, Leard Reed ⊕ Johnstown, Pa.; born in Pittsburgh Jan. 1, 1896; Jefferson Medical College of Philadelphia, 1924; fellow of the International College of Surgeons and the American College of Surgeons; member of the American Association of Railroad Surgeons; in 1924 president of the Cambria County Medical Society; trustee and councilor, 11th Councilor District, Medical Society of the State of Pennsylvania; organizer and president of the Cambria County Unit, American Cancer Society; president-elect of the Wainwright Tumor Clinic Association; veteran of World War I; associated with the Conemaugh Valley Memorial and Mercy hospitals; died March 13, aged 62, of acute coronary occlusion.

Ambrose, Charles D., Ligonier, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1900; associated with the Latrobe (Pa.) Hospital; died March 15, aged 81, of cardiac failure.

Anthony, Paul Henry ⊕ Kankakee, Ill.; Chicago College of Medicine and Surgery, 1912; died March 21, aged 67.

Armstrong, Charles Joseph ⊕ Louisville, Ky.; Harvard Medical School, Boston, 1922; professor emeritus of surgery at the University of Louisville School of Medicine; specialist certified by the American Board of Plastic Surgery; member of the American Association of Plastic Surgery and the American Society of Plastic and Reconstructive Surgery; fellow of the American College of Surgeons; veteran of World War II; associated with St. Anthony, Baptist, Kosair, and Children's hospitals; died March 9, aged 68, of cirrhosis of the liver.

Arnold, Marion Francis Jr., New Palestine, Ind.; Indiana University School of Medicine, Indianapolis, 1944; veteran of World War II; for many years assistant medical director at Inland Steel Manufacturing Company in East Chicago; died in the Hancock County Memorial Hospital, Greenfield, Feb. 27, aged 40.

Ashton, Dorothy Laing ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1921; associate professor of gynecology at Woman's Medical College of Pennsylvania; fellow of the American College of Surgeons; served as physician to women students at Swarthmore (Pa.) College; on the staff of the Woman's Hospital, where she died March 19, aged 69, of myocardial infarction with ventricular rupture.

Athey, Clanton Ray, Muskogee, Okla.; University of Alabama School of Medicine, Mobile, 1910; veteran of World War I; served in the Veterans Administration; died March 7, aged 71.

Babendreer, Estelle Turner ⊕ Ocean Springs, Miss.; Pulte Medical College, Homeopathic, Cincinnati, 1896; served on the staff of the New Biloxi Hospital in Biloxi, died March 12, aged 86, of uremia.

Baltimore, Louis ⊕ Los Angeles; Stanford University School of Medicine, San Francisco, 1926; specialist certified by the American Board of Radiol-

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⊕ Indicates Member of the American Medical Association.

ogy; for many years associated with the Los Angeles County General Hospital and the Ross–Loos Clinic; died in the Queen of Angels Hospital; died March 14, aged 58, of coronary thrombosis.

Barker, John Gould ⊕ Chicago; Jenner Medical College, Chicago, 1914; physician and surgeon for the Chicago Board of Education, assigned to the Chicago Parental School; died in the Wesley Memorial Hospital March 24, aged 69.

Bobb, Byron Arthur, Monrovia, Calif.; Northwestern University Medical School, Chicago, 1894; served in France during World War I; formerly practiced in Mitchell, S. D., where he was associated with Methodist Hospital and served as president of the board of trustees of Dakota Wesleyan University; past-president of the South Dakota Medical Association; fellow of the American College of Surgeons; died March 6, aged 87.

Bradbury, Anderson Davis, Kansas City, Mo.; Meharry Medical College, Nashville, Tenn., 1907; formerly on the staff of the Kansas City General Hospital number 2; died Feb. 25, aged 83.

Braun, Edward Jay ⊕ Cleveland; University of Pittsburgh School of Medicine, 1914; veteran of World War I; for many years associated with the city health department; on the staff of the Polyclinic Hospital; died March 3, aged 67, of a heart attack.

Brown, George Christopher, Millbury, Mass.; Jefferson Medical College of Philadelphia, 1902; consultant on the staff of St. Vincent Hospital in Worcester, where he died March 9, aged 78, of acute cystitis, and arteriosclerotic heart disease.

Brown, Oliver Clinton ⊕ Fort Lauderdale, Fla.; the Hahnemann Medical College and Hospital, Chicago, 1911; past-president of the Broward County Medical Society; associated with Broward General and Holy Cross hospitals; died in Birmingham, Ala., March 10, aged 69, of carcinoma of the lung.

Brown, Orville G. ⊕ Colonel, U. S. Army, retired, Tucson, Ariz.; Columbian University Medical Department, Washington, D. C., 1900; fellow of the American College of Surgeons; veteran of World War I; entered the regular Army in 1903 and retired May 31, 1938; at one time superintendent of the Gorgas Hospital in Ancon, Canal Zone; died March 15, aged 83, of myocardial infarction.

Chandler, Henry E. ⊕ Mount Vernon, Texas (licensed in Texas, under the Act of 1901); died in the Franklin County Hospital Feb. 15, aged 82, of acute coronary occlusion and arteriosclerosis.

Claiborn, Edward G. ⊕ Camdenton, Mo.; Missouri Medical College, St. Louis, 1896; died in St. Mary's Hospital, Jefferson City, March 11, aged 84, of intestinal obstruction.

Claridge, John Daniel ⊕ Chicago; Northwestern University Medical School, Chicago, 1918; associate clinical professor of bone and joint surgery at Stritch School of Medicine of Loyola University; fellow of the American College of Surgeons; member of the Chicago Surgical Society; veteran of World War I; surgeon for Chicago White Sox; on the staff of the Mercy Hospital, where he died March 20, aged 66, of mesenteric thrombosis.

Copeland, Miles Axe ⊕ Birmingham, Ala.; Birmingham Medical College, 1903; University of the South Medical Department, Sewanee, Tenn., 1903; served on the faculty of the Birmingham Medical College; died March 9, aged 89, of cerebral hemorrhage.

Cummins, Loretta Joy O'Brien ⊕ Boston; Tufts College Medical School, Boston, 1903; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; past-president of the New England Dermatological Society; associated with Massachusetts General Hospital, where she died at the Phillips House Feb. 25, aged 75, of bronchopneumonia and pulmonary fibrosis.

Fineberg, Maxwell ⊕ St. Louis; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; on the staff of the Jewish Hospital; died March 8, aged 57, of cerebral hemorrhage.

Fitts, John Baker ⊕ Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1912; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; formerly on the faculty of the Emory University School of Medicine; veteran of World War I; associated with Emory, Crawford W. Long, and Grady hospitals; died March 5, aged 69.

Foley, Carroll Edward ⊕ Front Royal, Va.; University College of Medicine, Richmond, 1913; chie surgeon, eye, ear, nose and throat, Warren Memorial Hospital in Front Royal and Fauquie Hospital in Warrenton; died Feb. 27, aged 71, o a heart attack.

Freedland, Marvin Sol ⊕ Miami, Fla.; Chicago Medical School, 1952; certified by the National Board of Medical Examiners; on the staffs of Mercy and

Jackson Memorial hospitals; member of the American Academy of General Practice; died March 8, aged 35, of acute myocardial infarction.

Fridell, Glen William ⊕ Slater, Iowa; State University of Iowa College of Medicine, Iowa City, 1946; formerly an officer in the medical corps of the Army of the United States; associated with Iowa Lutheran Hospital, Des Moines, where he died March 5, aged 35, of pulmonary embolism and multiple fractures, as the result of an automobile accident.

Gannon, Charles Henry ⊕ Cranston, R. I.; Maryland Medical College, Baltimore, 1913; veteran of World Wars I and II; served on the staff of the State Hospital for Mental Diseases at Howard; died in Our Lady of Fatima Hospital in North Providence March 1, aged 71.

Hyskell, William Emory, Meadville, Pa.; Jefferson Medical College of Philadelphia, 1903; an associate member of the American Medical Association; served as a member of the board of health of Meadville and as medical director of Crawford County; veteran of World War I; died in the Meadville City Hospital March 8, aged 82, of bronchopneumonia and cerebral hemorrhage.

Johnston, Ira Leonidas ⊕ Samson, Ala.; Memphis (Tenn.) Hospital Medical College, 1903; veteran of World War I; past-president of the Geneva County Medical Society; died Feb. 5, aged 80, of pneumonia and heart disease.

Kahn, Samuel ⊕ New York City; Columbia University College of Physicians and Surgeons, New York City, 1916; fellow of the American College of Chest Physicians; on the medical examining staff of the New York State Workmen's Compensation Board from 1925 until his retirement in 1956; veteran of World War I; joint editor of "Trauma and Disease"; died March 14, aged 66, of heart disease.

Kapinos, Michael Joseph, Boston; College of Physicians and Surgeons, Boston, 1939; died in Boston City Hospital March 2, aged 43.

Kehler, B. Frank, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1893; Medico-Chirurgical College of Philadelphia, 1907; died March 1, aged 89, of heart disease and arteriosclerosis.

Lakin, Harry Pearce, North Wales, Pa.; Jefferson Medical College of Philadelphia, 1890; an associate member of the American Medical Association; formerly practiced in Philadelphia, where he was associated with Methodist Episcopal Hospital; died in Ambler March 16, aged 93, of heart failure.

Landry, Paul Tillon, Norco, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1913; for many years parish coroner; died March 3, aged 70, of pulmonary emphysema.

Lear, William Dale ⊕ Ainsworth, Neb.; University of Nebraska College of Medicine, Omaha, 1924; member of the American Academy of General Practice; veteran of World War I; served for many years as a member of the board of education; on the staff of the Ainsworth Clinic and Hospital; died Feb. 10, aged 60, of a heart attack.

Lindgren, Elis Ilmari, Lake Worth, Fla.; Helsingfors Universitet Medicinska Fakulteten, Helsingfors, Finland, 1903; an associate member of the American Medical Association; member of the Medical Society of the State of New York; died Jan. 21, aged 80, of coronary occlusion.

Lisk, Percy Franklin, Fort McCoy, Fla.; Atlanta School of Medicine, 1906; an associate member of the American Medical Association; died in the Florida State Hospital, Chattahoochee, Jan. 22, aged 76, of cirrhosis of the liver and arteriosclerosis.

Loop, Floyd Addison ⊕ Lafayette, Ind.; George Washington University School of Medicine, Washington, D. C., 1910; fellow of the American College of Physicians; associated with Lafayette Home Hospital and St. Elizabeth Hospital, where he died March 10, aged 81, of arteriosclerotic heart disease.

Looze, Anthony Joseph, Cleveland; St. Louis University School of Medicine, St. Louis, 1915; member of the American Psychiatric Association; on the staff of the Cleveland State Hospital; died in the Crile Veterans Administration Hospital Feb. 26, aged 66, of bronchogenic carcinoma.

McCauley, Ernest Ruffin ⊕ Moody, Texas; Southwestern University Medical College, Dallas, 1908; past-president of the school board; served as city health officer; died March 5, aged 76, of a heart attack.

McConkey, Frank Vance, York, Pa.; Jefferson Medical College of Philadelphia, 1909; an associate member of the American Medical Association; member of the American Society of Anesthesiologists; on the staff of the York Hospital; died March 8, aged 71, of cerebral thrombosis.

McDonald, Richard Joseph ⊕ Paterson, N. J.; Georgetown University School of Medicine, Washington, D. C., 1913; served on the faculty at the New York Polyclinic Medical School and Hospital in New York City; specialist certified by the American Board of Dermatology and Syphilology; veteran of World War I; associated with St. Joseph's Hospital; died March 12, aged 67, of myocardial infarction and cerebral arteriosclerosis.

McKenzie, Gordon Columbus, Ashburn, Ga.; Atlanta College of Physicians and Surgeons, 1906; served as a member of the county board of education and as chairman of the Ashburn Board of Education; died in the Turner County Hospital Feb. 26, aged 73, of heart disease.

MacGregor, Herbert Paterson, New York City; Cornell University Medical College, New York City, 1905; an associate member of the American Medical Association; on the staff of the Lutheran Hospital; died in the Long Island College Hospital, Brooklyn, March 15, aged 84, of arteriosclerotic heart disease.

Mann, Herbert Christian ⊕ Orchard Park, N. Y.; University of Buffalo School of Medicine, 1911; veteran of World War I; died in the Buffalo General Hospital March 8, aged 70, of myocardial infarction.

Nilsson, John Frederick ⊕ Omaha; Baylor University College of Medicine, Dallas, Texas, 1939; fellow of the American College of Surgeons; on the faculty of the University of Nebraska College of Medicine; on the staffs of the Nebraska Methodist and Douglas County hospitals and Immanuel Hospital, where he died Feb. 9, aged 53, of essential hypertension with heart disease.

Norby, Charles Philip, Rensselaer, Ind.; Northwestern University Medical School, Chicago, 1905; died in the Dr. Norman M. Beatty Memorial Hospital, Westville, Feb. 14, aged 78, of bilateral bronchopneumonia.

Norman, Alfred James, Healdsburg, Calif.; Homeopathic Medical College of Missouri, St. Louis, 1889; veteran of the Spanish-American War and World War I; formerly associated with the San Francisco Hospital; died in Letterman Army Hospital, San Francisco, March 2, aged 90, of bronchopneumonia and intestinal obstruction.

Oldham, Gordon Dittman ⊕ Twin Falls, Idaho; Northwestern University Medical School, Chicago, 1937; a director of the Fidelity National Bank; died in the Latter Day Saints Hospital in Salt Lake City, Utah, March 6, aged 47, of chronic myelocytic leukemia.

Ponder, James Maxie, St. Petersburg, Fla.; Meharry Medical College, Nashville, Tenn., 1915; veteran of World War I; died in the Veterans Administration Hospital in Bay Pines March 4, aged 70, of myocardial infarction.

Pressly, James Strong Moffatt, Troy, Tenn.; Vanderbilt University School of Medicine, Nashville, 1910; formerly associated with the U. S. Public Health Service; veteran of World War I; died in the Obion County General Hospital, Union City, Feb. 11, aged 71, of emphysema and cor pulmonale.

Rich, Riley Gilbert, David City, Neb.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; veteran of World War I; served as health officer; died Feb. 13, aged 93, of leukemia.

Rock, John Lestrange ⊕ Oglesby, Ill.; University of Illinois College of Medicine, Chicago, 1916; member of the Industrial Medical Association; president of the First National Bank of Oglesby; past-president of the La Salle County Medical Society; died in the Mayo Clinic, Rochester, Minn., March 18, aged 67.

Rudd, Anna Evans Corlies ⊕ Durham, N. H.; Woman's Medical College of Pennsylvania, Philadelphia, 1904; died in Willoughby, Ohio, Feb. 21, aged 77.

Savage, Harvey B., Denison, Texas; Hospital College of Medicine, Louisville, Ky., 1903; died in Sherman Jan. 26, aged 83.

Scanlan, Thomas Joseph Daniel ⊕ Lebanon, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1931; veteran of World War II; associated with the Veterans Administration Hospital; service member of the American Medical Association; died Feb. 7, aged 54, of coronary occlusion.

Sharrer, Harry E., Sarasota, Fla.; Medical College of Ohio, Cincinnati, 1896; died March 3, aged 84, of cerebral thrombosis and arteriosclerosis.

Stetson, Elbridge Gerry Allen ⊕ Brunswick, Maine, Medical School of Maine, Portland, 1898; veteran of World War I; town health officer for many years; died March 3, aged 82, of cancer.

Stevenson, Clyde Allison ⊕ Camilla, Ga.; Atlanta School of Medicine, 1907; served as mayor of Camilla and member of the board of education; associated with the Mitchell County Hospital; died Feb. 1, aged 73, of asphyxia in a fire which destroyed his home.

Stover, Arthur Reece ⊕ Holbrook, Ariz.; Missouri Medical College, St. Louis, 1893; member of the Arkansas Medical Society; served on the faculty of the University of Arkansas School of Medicine in Little Rock, and the Chicago Medical School, died Feb. 9, aged 88.

Sturdevant, Lazelle Brantly ⊕ Surgeon, U. S. Public Health Service, retired, Seattle; University of Nebraska College of Medicine, Omaha, 1909; retired from the U. S. Public Health Service in November, 1946; veteran of World War I; served on the staff of the U. S. Public Health Service Hospital, where he died Feb. 28, aged 78, of bronchopneumonia and Parkinson's syndrome.

FOREIGN LETTERS

AUSTRIA

Sphincterotomy on Patients with Chronic Pancreatitis.—At the meeting of the Society of Physicians in Vienna on Feb. 21, Dr. A. Fritsch reported a series of 45 sphincterotomies performed on patients with chronic pancreatitis. Of these, 34 patients tolerated the operation well and had no postoperative complications; 32 were reexamined and 27 of them were without complaint, 3 had mild indigestion, and 2 had the same pain that led to operation. Calculi in the ampulla of Vater and spasm of the sphincter of Oddi should be demonstrated by cholangiography before sphincterotomy is advised. Primary closure of the bile-passage is generally preferred to T-drainage. In 15 patients a supraduodenal choledochoduodenostomy was performed in addition to sphincterotomy, since a relative stenosis of the intrapancreatic segment of the common bile duct had occurred.

Prematurity and Infant Mortality.—At the same meeting, Dr. H. Gross stated that the death rate of the normal born infant is 1.99% at the highest. To justify the separate grouping of the infants born at term and the premature infants, he showed a steep increase in the death rate with decreasing birthweight. In order to reduce the infant mortality, it is advisable to do everything possible to keep the premature infant alive. For this purpose it is necessary to bring the existing equipment for the rearing of the premature infant up to date, as has been done in the countries with a low infant mortality. Furthermore everything possible should be done to obtain an additional reduction in the infant death rate by establishing hospital nurseries under the direction of pediatricians. Broader use of infant welfare centers by mothers was also urged. Dr. H. Koelbl said that the cause for the increasing mortality among premature infants is not the lack of love for the child or abortion but the heavy workload placed on women working on farms and in industry.

Genital and Peritoneal Tuberculosis.—At the same meeting, Dr. H. Knaus stated that the operative treatment of patients with genital and peritoneal tuberculosis requires on principle that the diseased oviducts be removed first. Characteristically the tuberculosis is restricted to the ampullary portion of the oviducts. Of 100 patients who were operated on, 68 had a salpingitis, 64 had a tuberculosis peritonitis, 59 had pleuritis, 33 had pulmonary tuberculosis, and 11 had tuberculosis of the endometrium. Peritoneal tuberculosis is caused almost without exception by infection in the oviduct, which is first involved hematogenously. Removal of the diseased oviduct results in immediate cure. Patients with tuberculosis of the endometrium, which also occurs secondarily, are almost always cured after the extirpation of the tuberculosis oviducts. Of the 100 patients operated on only one died. She died on the eighth postoperative day of ulcerative colitis after an overdose of antibiotics (3 Gm. of oxytetracycline intravenously). The rest were permanently cured within only a few weeks, although some of them had been ill for years and had been treated unsuccessfully with drugs.

Carcinoma of the Uterine Cervix.—At the meeting of the Society of Gynecology and Obstetrics in February in Vienna, Dr. H. Högler said that the process of exposing and freeing the ureter during radical operations (Schauta-Amreich's technique) has been unjustly labeled as being especially difficult. The procedure may, however, be simplified by considering the preoperative cystoscopic findings. The speaker reported on a series of 274 patients who were hospitalized from May, 1945, to the end of 1952 with carcinoma of the uterine cervix. Of these, 219 were subjected to radical hysterectomy (175 Schauta-Amreich and 44 Wertheim operations), the rest were treated with radium. The percentage of operable patients after irradiation therapy was 79.9. Permanent cures were obtained in 70.3% of the patients who were treated with vaginal hysterectomy and 45.5% of those subjected to Wertheim's operation, or 65.3% for both operations. The primary death rate in the 219 patients operated on was 3.2%. Of the 55 patients who were treated with radium, 13 were alive after five years. Complete cure was obtained in 56.9% of the patients. Vesicoureteral or rectal fistulas did not develop in any of the patients. In a second series of 266 patients, 231 were subjected to the Schauta-Amreich operation and 35 to the Wertheim operation between January, 1953, and the end of 1957. In the same period 45 patients were treated with irradiation. The primary operative death rate for both methods was 2.3%. A ureteral fistula occurred in one patient, but this was spontaneously cured, with restitution of the renal function before the patient left the hospital. The speaker recommended radical vaginal hysterectomy for all patients with group 1 carcinoma of the uterine cervix.

The items in these letters are contributed by regular correspondents in the various foreign countries.

BRAZIL

Pelvic Exenteration.—Eight cases of pelvic exenterations (six total and two partial) for primary carcinoma of the uterine cervix, vulva, rectum and anus, and the bladder, with local invasion and lymph node metastases were reported by Dr. Azael Leistner (*Revista de medicina e cirurgia de São Paulo*, December, 1957). Most of the patients had already had a total hysterectomy or vulvectomy or had had roentgen and radium therapy with poor results. Dr. Leistner made seven temporary cutaneous ureterostomies (he does not advise ureterosigmoidostomies because of such complications as stenosis, infection, and acidosis) and one ileocecal bladder which should be attempted if the malignancy is supposedly cured. The amount of whole blood used during the operation varied from 1,500 ml. (3 pt.) in one case to 3,800 ml. (6.5 pt.) in one case. In total exenterations the hypogastric vessels are ligated and resected. The perineal excision is as extensive as possible. In one patient the bladder was suspended and the abdominopelvic separation was made with a graft of fascia lata, with excellent results. In another the pelvis was peritonealized by suturing the anterior parietal peritoneum to the posterior peritoneum. There were three deaths in the immediate postoperative period and three in the late postoperative period. One patient after six months was in poor condition and the remaining patient after two months was well and was expected to have a long survival. The unpromising results were probably due to the fact that in many cases the operation was performed for palliative reasons (patients with urinary and fecal fistulas).

DENMARK

Reactions to Penicillin.—Since May, 1956, patients coming to the outpatient department of the Bispebjerg Hospital have been questioned routinely about earlier treatment with penicillin. Of 8,954 consecutive patients, 4,204 (46.9%) had a record of penicillin treatment. Of these, 221 had had side-effects which in 113 consisted of urticaria, and in 40 of malaise. In 30 there had been a local reaction in the form of paresthesia, furuncles, or edema of a limb; in 16 angioneurotic edema; and in 10 glossitis. Among the rarer reactions were arthralgia and expiratory dyspnea. In none was there any record of anaphylactic shock, exfoliative dermatitis, or purpura. Dr. Preben Foged (*Nordisk medicin*, March 6, 1958) used penicillinase in the treatment of such patients.

Biopsies by General Practitioners.—In 1951 the Danish National Cancer League offered financial support for the examination of biopsy specimens sent by general practitioners to any of the League's radium stations. Dr. J. V. Dahlerup (*Ugeskrift for læger*, Feb. 27, 1958) reported that he examined 85 such specimens, 11 from males and 74 from females, reflecting the frequency with which the uterus and breast raise problems of diagnosis. When a case did not call for immediate reference to a specialist or admission to hospital, the specimens (except those from the uterus which required no anesthesia) were excised under local anesthesia. In 2 of 32 uterine specimens no abnormality could be found Of the remaining 30 specimens, 4 showed carcinoma of the cervix, 20 cervical erosion, 2 cervicitis, and 4 cervical polyps. All the 18 breast specimens showed fibrosis or fibroadenomatosis. In a specimen from a man, a seemingly innocent cutaneous wart proved to be malignant. In one man and two women the diagnosis was lipoma. Benign melanoma of the skin was diagnosed in one man and five women. In six patients malignant disease was diagnosed at an early stage, thanks to the biopsies.

Traction for Lumbar Disk Herniation.—Dr. J. W Hansen (*Ugeskrift for læger*, Feb. 13, 1958) evaluated the effects of traction and manipulation on 41 patients with lumbar disk herniation verified by myelography. In the absence of complications, 10 courses of traction were given on a traction board devised so as to almost eliminate friction with underlying structures. When traction had no effect, trial was made with manipulation with the "pelvic twist." In only seven patients could a subsequent operation be avoided, and for the improved condition credit could not in every case be given to traction or manipulation. In only two could any beneficial effect be observed in response to the traction which in three patients was followed by severe pain. In one of these an operation revealed adhesions between the root and the herniated disk. In another the root was stretched over a large herniation. In the third an operation revealed a red and edematous root which was possibly damaged by the traction. The lumbar spine was manipulated in 27 patients, in only one of whom could a partial cure be claimed. Even in this patient some of the pain persisted, and he could not resume heavy work. Hansen concluded that neither traction nor manipulation can have any effect on a herniated lumbar disk when it is large enough to yield a positive myelogram. When recovery coincides with such treatment, the tendency of this ailment to spontaneous recovery should be borne in mind.

Long-Term Treatment with Anticoagulants.—Should patients who have had a myocardial infarct continue for the rest of their lives to take anticoagulants? A debate on this subject was reported in *Nordisk medicin* for March 6. Comparative tests in the hospitals of Copenhagen and Odense seem to support the use of anticoagulants, though their sponsors stressed the immaturity of their findings. Dr. T. Hilden reported that a group of 56 patients had been given bishydroxycoumarin or some other anticoagulant while a group of 88 controls were given a placebo. In the first group there had been five deaths but no infarcts since this test was started in 1955. In the second group there had been 14 deaths and 3 new infarcts. The patients had come for a checkup at intervals of one to four weeks. In only 2 of the 11 patients with hemorrhage was it necessary to discontinue the treatment. Dr. J. Clausen reported favorably on this treatment which he had given to 50 patients while a similar number had served as controls. As for the objection that anticoagulants promote hypochondriasis, he had found on the contrary that the medical supervision had had a reassuring effect on his patients.

Acta Anaesthesiologica Scandinavica.—In October, 1957, the first number of *Acta anaesthesiologica scandinavica* was published under the auspices of the University of Århus. Published in English, this latest in the series of Scandinavian Actas will appear as a quarterly and will be devoted to experimental and clinical research in anesthesiology.

Treatment of Neuroses and Psychoses with Meprobamate.—Dr. M. Hertz (*Ugeskrift for læger*, March 13, 1958) used double-blind placebo tests on 21 patients with neuroses and 20 with severe psychoses. He gave 200 to 2,000 mg. of meprobamate three times daily. The results of this treatment, as gauged by different reactions to it, showed it to be remarkably effective for the neuroses and, to a lesser extent, for the psychoses without provoking habituation. The usual dosage of 400 mg. three times a day would seem to be inadequate as judged by the results in 19 patients, mostly with chronic psychosis, given this dose.

FRANCE

Luteal Activity and Vaginal Smears.—L. de Gennes and co-workers (*La presse medicale* 66:559, 1958) found that vaginal smears indicated the action of the luteal hormone on the vagina as shown by an increase of the cell plication and patches of desquamation, by a diminution in cell cornification, and eventually by a diminution in external basal cells; but none of these manifestations is specific. An isolated smear showing a plication index of eosinophils of less than 40% with no patches of desquamation is proof of the absence of luteal action. On the contrary, an isolated smear showing a massive cell plication index greater than 65% and significant patches of desquamation is not always a sign of luteal activity. A series of smears made regularly throughout the menstrual cycle and showing (1) in the middle of the cycle an ovulatory peak of eosinophils with pycnotic nuclei exceeding 50%, followed by a marked drop in cell cornification; and (2) an increase on several smears, in the luteal phase, of the patches of desquamation and cell plication, as compared with the follicular phase, afford proof of luteal action. Vaginal smears afford only slight evidence of luteal secretion. In patients with parasitization or vaginal or cervical infection, no positive or negative evidence can be had from examination of an isolated smear. In this eventuality negative findings should be disregarded, even though a series of smears were made throughout the menstrual cycle. If a series of smears shows a marked and persistent increase, in the luteal phase as compared with the follicular phase of the same cycle, regarding the plication and the patches of desquamation, the estrogenic curve being otherwise normal, the positive findings may be considered valid.

Arteriovenous Angiomas of the Brain.—J. E. Paillas and co-workers (*La presse medicale* 66:525, 1958) said that although of congenital origin, arteriovenous angiomas of the brain are usually found only in adults. They were, however, able to collect a series of 11 children with such tumors, aged from 4 to 15 years. The predominant and typical manifestations were suggestive of pure meningeal hemorrhage (1 case), intracerebral hematoma with a sudden onset (6 cases), and chronic focal epilepsy (4 cases). Cerebral angiography usually reveals the diagnosis. An electroencephalogram generally exhibits a focus of slow waves combined with paroxysmal peaks. Of the 11 children, 3 were operated on in coma. These three and six others were cured by operation (seven with no sequelae).

Tuberculous Bronchial Perforations.—A. Levi-Valensi and co-workers (*La presse medicale* 66:563, 1958) stated that intrabronchial perforation of mediastinal lymph nodes in adults was unknown until recently. In a series of 700 adult tuberculous patients in Algiers, aged 16 to 70 years, they found 300 with fistulas. Of these, 258 had pulmonary tuberculosis; 13 had lymphomediastinal or pleural localizations; and 29 had hemoptysis with no apparent cause. The percentage of perforations in the whole series was about 43 (46% in Europeans, and 38% in Mussulmans). The bronchoscopic aspect included punched-out perforations with anthracotic secretions, small perforations, and cicatricial fistulas. The lesions were unilateral in 83% of the patients. At 36 recent autopsies, 18 showed the presence of caseous adenopathies with perforation into the bronchi in 12.

Antihistaminics.—Louis Desliens (*La presse medicale* 66:562, 1958) demonstrated that cows are very susceptible to histamine products. A dose of 25 mg. of histamine bi-hydrochlorate can kill a cow weighing 500 kg. Within about 30 seconds of an intravenous injection, panting, hemal hyperviscosity, and discoloration of the mucosa may be seen. Within a few minutes the viscosity and erythrocyte count can double. Epinephrine when injected after histamine slightly reduced the histaminic shock; when injected before giving the histamine it proved very effective. Ephedrine does not produce any appreciable effect. Cocaine and morphine, which cause marked hypertension in horses and cows, do not prevent the histaminic shock but render it shorter. Pilocarpine, physostigmine, and acetylcholine, although increasing the viscosity, do not markedly aggravate the shock. Atropine does not modify it much. Magnesium hyposulfite does not afford much protection. A large injection of isotonic Locke's solution or a hypertonic injection of sodium chloride, glycerine, and saccharose dilutes the blood and produces a hypoviscosity. The histamine that is introduced later does not induce the same hemoconcentration. Hexamethonium does not prevent histamine shock. Promethazine and chlorpromazine give excellent protection against shock.

Hyperadrenocorticism with Alkalosis and Hypokalemia.—In *La presse medicale* (vol. 66, p. 437, 1958) R. S. Mach and co-workers reported on two patients who had pulmonary carcinoma with bilateral adrenal metastases. They presented no clinical manifestation of Cushing's or Conn's syndrome but showed signs of a humoral hyperadrenocorticism with metabolic alkalosis, hypokalemia, hypochloremia, and hypernatremia. The humoral disorders and the diabetes in one of the patients could be explained by the observation of an exaggerated secretion of 17-hydroxycorticosteroids. In the other patient the finding of a lowered rate of urinary and adrenal aldosterone indicated that the presence of electrolytic disorders from a metabolic alkalosis with hypokalemia, which is an essential element of Conn's syndrome, does not necessarily depend on an exaggerated production of aldosterone.

Hypertension in the African Negro.—In *La presse medicale* (vol. 66, p. 439, 1958) M. Sankale and co-workers stated that arterial hypertension is not uncommon in the African Negro. The hypertension was of renal origin in 20% of their series. Menopause was rarely associated with hypertension, which was rare in the poor classes and in the rural areas, but frequent in the sedentary gourmand. Progressive hypertension was characterized by cardiac insufficiency and occasionally myocardial infarction. Cerebral vascular accidents occurred especially in patients over 45. The incidence of malignant hypertension was relatively high. This would appear as a secondary manifestation in 75% of these subjects.

Urinary Clearance of the 17-Hydroxycorticoids.—In *La presse medicale* (vol. 66, p. 437, 1958) H. Warembourg and co-workers stated that a two-month course of delta-1-cortisone in subjects with normal corticoadrenal function produced the following results: (1) an increase in the urinary clearance and blood level of the 17-hydroxycorticoids in the course of treatment and during the 10-to-20-day period after discontinuance of the treatment; (2) a more or less complete depression of the urinary clearance of hydrocortisone, this being consistent with the classical blocking of the ACTH secretion by metacortandracine and the ensuing rest period for the adrenal cortex; (3) the persistence for 10 to 30 days of the urinary clearance of a notable amount of delta-1-cortisone; and (4) after the course of delta-1-cortisone, rapid reappearance of hydrocortisone in the urine and return of a negative Thorn's test as early as the seventh day after interruption of the treatment. A study of the urinary elimination of 17-hydroxycorticoids in 19 tuberculous subjects showed that in all (except for two with hyposecretion) this clearance did not exceed the normal limits. In the patients being subjected to a delta-1-cortisone it was not possible to establish a relation of the quality of the therapeutic results obtained to the rate of urinary elimination of the 17-hydroxycorticoids before, during, and after treatment, but in the two patients eliminating initially very little of the 17-hydroxycorticoids, the results proved particularly favorable. These observations indicate that the action of corticoids in tuberculosis is essentially pharmacodynamic. But the possibility of exerting a favorable opotherapeutic activity should not be rejected for those exceptional patients with tuberculosis presenting an insufficiency in proteoglucidic corticoadrenal hormone.

Respiratory Resuscitation.—In *La presse medicale* (vol. 66, p. 460, 1958) P. Mollaret and co-workers reported that cuirass respirators should be given a high place in the treatment of respiratory insufficiency, even the first place in the chronic phase of poliomyelitic respiratory paralyses, on the dual condition that the indications for its use be properly determined and the device correctly adapted. An adequate cuirass respirator must secure enough pulmonary ventilation. Only those which surround both thorax and abdomen produce an effective ventilation. Furthermore the electromotor mechanism must be sufficiently powerful to develop inside the cuirass important pressure gradients. The device should be comfortable, which means that the cuirass must be light and supple and must have such a shape as makes it possible for the patient to bear its application throughout his waking hours. It must be strong, so that it can be used daily. It must be easily repaired to minimize periods of nonavailability. The daily duration of assistance with the cuirass is determined by the muscular progress in the patient as spirographically evidenced. If the respiratory recovery of the patient is not sufficient for him to get free from any ventilatory assistance, the cuirass respirator constitutes the best device in which to return the patient to his home.

INDIA

The Indian Council of Medical Research.—The Indian Research Fund Association, established in 1911, became the Indian Council of Medical Research in 1950. Under the National Malaria Control program, the Council is supporting studies on the mechanism of resistance of vector mosquitoes to DDT and the results obtained so far augur well for the success of the program. The Council's investigations into the problem of filariasis have yielded knowledge which is serving as a sheet anchor in control operations against this disease. Leprosy is beginning to yield as a result of researches on the mode of spread of this disease. Special operations to relieve persons suffering from advanced stages of this disease have been devised. Research has been encouraged in the problem of disposal of industrial wastes, particularly lac wastes. In addition to studies on smallpox and rabies, the Council has sponsored research on such viral diseases as Japanese B encephalitis and Russian spring–summer encephalitis. A country-wide campaign of DDT delousing resulted in eliminating plague from most of the endemic foci. Visceral leishmaniasis was successfully combated both from the point of view of treatment of patients and of control of the sand fly vector. The rickettsial diseases were controlled to a large extent. Malnutrition is a major problem. Bengal gram has been found to be of great value in the treatment of children suffering from kwashiorkor.

Effect of Chloramphenicol on Leukocytes.—Srivastava and Zaidi (*Journal of the Indian Medical Association,* vol. 30, March 1, 1958) fed normal rats 50 mg. of chloramphenicol per kilogram of body weight daily for six weeks. The animals developed diarrhea in the first two weeks, became emaciated, and lost much hair. These disturbances disappeared after two weeks and the animals started to regain weight in spite of continued chloramphenicol feeding. The gastrointestinal symptoms seen in the first two weeks may have been due to the depression of normal bacterial flora of the intestine resulting in the growth of Streptococcus faecalis and monilia. In the first two weeks, the normal flora adapted to the new environment, thereby restoring normal gastrointestinal function. There was a transient lowering of the leukocyte count in the first two weeks, and this also returned to the original level. This was probably due to the state of starvation produced by the initial gastrointestinal disturbances rather than to any direct depressant action on the leukocytes. Splenectomy in normal rats was followed by leukocytosis in the first week, the count then showed a gradual decrease although it remained higher than the original level up to the sixth week. Chloramphenicol feeding delayed the postsplenectomy peak by two weeks. This may have been due to a slight depression caused by the gastrointestinal disturbances or due to a temporary depression of leukopoiesis. The eosinophils showed a gradual and sustained rise after splenectomy, the maximum value being reached by the sixth week. Chloramphenicol feeding did not affect the circulating eosinophils of the eosinophil granulopoiesis in normal and splenectomized rats.

All-India Nutrition Conference.—At the second All-India Nutrition Conference in February, the Minister for Health said that the average Indian diet was composed largely of starch and was deficient in proteins, vitamins, and minerals. Malnutrition in the rural areas and among the poor can be eliminated only if the people are made to understand the importance of a proper diet and the proper use and preparing of the foods available.

Dimorphous Polyneuritic Leprosy.—Cochrane and Khanolkar (*Indian Journal of Medical Sciences,* vol. 12, January, 1958) described five lepers seen in different clinics who complained of anesthesia and whose condition was diagnosed as polyneuritic leprosy. They all complained of numbness and showed no other cutaneous manifestation. Biopsy specimens taken from subcutaneous nerves showed large numbers of Mycobacterium leprae. The histological structure was neither wholly tuberculoid nor wholly lepromatous in nature but suggestive of a dimorphous type of leprosy. The authors believe this dimorphous type is more widespread than was suspected. As in lepromatous and tuberculoid leprosy, so also in the dimorphous group there are clinical signs that manifest themselves not only as infiltrated lesions but also as macules and polyneuritic signs. These polyneuritic manifestations occur also in the two main types of leprosy, although they are rare in the lepromatous variety. This may be due to the initial pure neural stage in lepromatous leprosy being so transient that it is hardly recognized. A close study of leprosy among the Mongolian races may reveal the existence of polyneuritic lepromatous leprosy. The authors suggest that the dimorphous, neuritic, or polyneuritic case is a clinical entity and should be included in any detailed classification of leprosy. All clinical manifestations of leprosy (macular, infiltrated, or polyneuritic) have a dimorphous phase.

Serologic Tests for Syphilis.—C. W. Chacko and co-workers (*Indian Journal of Dermatology and Venereology,* vol. 23, October-December, 1957) stated that of all tests made on the spinal fluid, only the serologic tests constitute specific proof of the presence or absence of neurosyphilis. The Wassermann reaction when used as a routine test on the spinal fluid has certain limitations. It is not specific enough in the diagnosis of neurosyphilis and it cannot be used for quantitative estimations. In the

Institute of Venereology, Madras Medical College, the VDRL tube precipitin test using the cardiolipin antigen was introduced as the routine test on spinal fluid in 1953. The Kolmer modification of the Wassermann reaction using the cardiolipin antigen was introduced as an additional test. The authors compared the results of the two techniques on 489 specimens of spinal fluid collected from 49 patients with neurosyphilis and 440 with syphilis not affecting the nervous system. Cell counts and total protein estimations were also made simultaneously. The results showed that the two tests were comparable as to sensitivity and specificity. They agreed qualitatively in 95.6% of cases. Where the two tests agreed in their results, they correlated well with the cell counts, protein estimations, and clinical findings. Where they disagreed, there were no cases where the VDRL test was reactive and the Kolmer test was not. In all of them the VDRL test was nonreactive and the Kolmer test reactive. The authors recommended that the VDRL test be used as the single routine test while the complement fixation test using cardiolipin agent be performed only as an additional test in teaching institutions and reference laboratories.

NORWAY

Rehabilitation.—Dr. Gudmund Harlem (*Nordisk medicin*, Feb. 6, 1958) made a house-to-house study of two school districts with a total population of 1,865, only 5 of whom could not be found. Of the 1,860 examined 220 (12%) were suffering from ailments that from the strictly medical point of view were partially crippling, yet 128 of these were able to do full-time work. A scrutiny of the circumstances governing each of these cases showed that the unskilled worker fared worse than the skilled worker presumably because the latter was more adaptable. Furthermore the worker living in a community with ample differentiation of employment fared better than the worker more geographically isolated from his fellow-beings. In the light of these and similar observations, Harlem stressed the importance of a rehabilitation mentality which goes far beyond the strictly medical aspect of the problem in each case. He found that 13 of 25 patients with heart disease, 12 of 23 with tuberculosis, 13 of 15 with lumbago or sciatica, and 10 of 15 with asthma or bronchitis were already fully employed, but in only 4 of 10 with arthrosis of a single joint could this claim be made.

Training Abroad for Medical Students.—The shortage of facilities for medical training at the universities of Oslo and Bergen led in 1956 and 1957 to a veritable exodus of medical students to foreign schools. By the end of 1957 as many as 226 were studying in Germany, 66 in Austria, 64 in Switzerland, 46 in Holland, 32 in Great Britain, 4 i France, 1 in Sweden, and 1 in the United State Commenting on these figures in *Tidsskrift for de norske lægeforening* for Feb. 1, Dr. J. Haffner, former President of the Norwegian Medical Ass ciation, points out that by 1960-1961 these studen will be coming to Norway at the rate of 50 a yea looking for internships, but by then the supply o such appointments may be less than the need f them, and Norway may wake up to a serious su plus, even a surfeit, of physicians, for by then som 125 will be turned out yearly by the two Norwegia universities.

Ornithosis.—Dr. C. Lerche (*Journal of the Osl City Hospitals*, vol. 8, 1958) studied the prevalenc of ornithosis antibodies among patients in Osl city hospitals. Between Aug. 1, 1955, and May 1 1957, 820 patients with a tentative diagnosis o viral pneumonia were examined at the Institute o Bacteriology of Ullevaal Hospital. Among the were 94 (11.5%) with a positive complement fix tion test of a titer of 1:30 or more for ornithosi None of them presented evidence of lymphogranu loma venereum, and all but one had a negativ serologic test for syphilis. Seven patients were unde the age of 9, and nine were between 10 and 19 The four oldest were over 60. The patients coul be classed in three groups, in the first of which 1 had high fever, malaise, headache, severe coug with scanty sputum, and pain in the chest. The 2 patients in the second group had been ailing fo several months before admission to hospital for a influenza-like illness whose protracted course ha led to the discovery of radiologically demonstrabl pulmonary infiltrations. The 55 patients in the thir group were more heterogeneous, and the clinician in charge of them had challenged the diagnosis o ornithosis in spite of the positive serologic findings Between Nov. 1, 1956, and June 1, 1957, complement fixation tests of 416 blood donors showed 1 positive reactions.

Thyrotoxicosis.—Drs. K. Bie and G. Omland (*Nordisk medicin*, March 6, 1958) reported a series of 169 patients with thyrotoxicosis of whom 145 were operated on and 24 received medical treatment only. About 25% of these patients were male. The youngest was 4 years old and the oldest was 82. In most cases preoperative treatment with iodine for 9 days was followed by subtotal thyroidectomy, the patients being discharged 31 days after admission. Under medical treatment only, the average stay in hospital was 24 days. There were no postoperative deaths, but in five patients there was paralysis of the recurrent laryngeal nerve, two of whom recovered. There were four in whom thyrotoxicosis persisted and eight in whom it recurred Three developed tetany and five myxedema. From follow-up examinations it appeared that good results of the operation could be claimed in 91%. The success of operative treatment depends largely on the skill and experience of the surgeon. Operative complications are rare in hospitals specializing in this field as compared with other hospitals.

PERU

Isoniazid in Advanced Tuberculosis.—In the treatment of advanced pulmonary tuberculosis, isoniazid alone may be as effective as in combination with either aminosalicylic acid or streptomycin according to Dr. F. Vargas Jiménez (*Anales de la facultad de medicina,* vol. 40, 1957). He gave 5 or 10 mg. of isoniazid per kilogram of body weight daily for 9 to 21 months to 43 patients with moderate to far advanced pulmonary tuberculosis. None of the patients had had any previous treatment and no other drug was used. All but three patients were male, and the ages of 34 ranged from 15 to 29 years. Thirty of the patients had had symptoms for more than six months prior to starting treatment. Twenty-three had single cavities, 16 multiple cavities, and 4 no cavities. In 8 at least one lobe was destroyed, and extrapulmonary tuberculosis was present in 14. Follow-up studies of 34 about two years after treatment was started showed that 28% had become noninfective and in 24 the cavities had closed. Significant radiologic improvement was observed in 32. Of the 15 patients with moderately advanced tuberculosis, all showed substantial radiologic improvement, 13 showed bacteriological conversion, and 11 closure of the cavities at the end of the second year of observation. Of the remaining 19 patients, all with far advanced lesions, 17 showed favorable radiologic response, 15 showed bacteriological conversion, and 11 closure of the cavities. Serious side-effects attributable to the prolonged administration of isoniazid occurred in only one patient who developed a peripheral neuritis. Although recovery followed drug withdrawal, a severe relapse of his tuberculosis occurred.

Diagnostic Value of Pyelonephritis Cells.—As a consequence of Sterheimer and Malbin's report about the finding of "granular motility" or pyelonephritis cells in the urine of patients suffering from pyelonephritis, Dr. O. E. Talledo (*Anales de la facultad de medicina,* same issue) conducted a study in which cells of this type were found in 25 of 26 patients suffering from pyelonephritis alone; in 23 of 26 with pyelonephritis associated with some other diseases of the kidney or the urinary tract; and in 7 of 8 with proved renal tuberculosis with probable pyelonephritis. Further investigations failed to demonstrate "granular motility cells" in any of 10 miscellaneous patients with diverse conditions other than pyelonephritis known to involve the kidney either primarily or secondarily. These cells were also consistently absent from the urine of 35 subjects with no evidence of urinary tract infection. The author found the presence of "granular motility cells" to be nearly as useful as culture of the urine for diagnosing pyelonephritis. Escherichia coli was the organism most frequently found in cultures, as it accounted for 50% of those that were positive. Next in frequency were Paracolon organisms in 27.2%, and Proteus organisms and micrococci in 15.1%. The author concluded that a close relationship exists between the finding of pyelonephritis cells in the urinary sediment and the diagnosis of pyelonephritis by cultures of the urine.

Chloramphenicol in Bartonellosis.—Opinions regarding the treatment of bartonellosis have varied but in the last five years there has been growing agreement that therapy should be directed not only against the bartonellosis but also against the salmonellosis that complicates most of the cases of the disease. In most fatal cases death was caused by the complicating salmonellosis rather than the bartonellosis. This was the reason for any beneficial effect of penicillin given to patients with bartonellosis. With the advent of the broad-spectrum antibiotics it was believed that an effective treatment for bartonellosis as well as for salmonellosis had been provided. Of these, chloramphenicol was considered by most observers to be the best. Dr. Manuel Cuadra (same journal), however, called attention to the fact that this antibiotic usually has been given late in the course of the acute phase of the disease when salmonellosis had already become established and that little was known about whether chloramphenicol was as effective when given earlier when the patients' blood revealed Bartonella only. The author gave chloramphenicol to four patients with bartonellosis during the initial invasive stage of the disease. Blood cultures revealed Bartonella but no Salmonella. The drug proved to be of definite value in the four patients. Symptoms were relieved and the blood cultures became negative within 24 to 48 hours. It was particularly noteworthy that even the hemolysis was completely arrested in view of the fact that in patients treated with the same drug but at later periods there was no improvement in the anemia. Chloramphenicol also prevented the development of the usual verrucous lesions. Relapse occurred in only one patient, but this was promptly controlled by a further course of chloramphenicol.

Blood Groups in Peruvian Indians.—In the same journal issue, C. Reynafarge reported that he examined blood samples from 800 Indians of the central Peruvian Andes and found that 81% of the entire series belonged in group 0. This finding agreed with the reports of other investigators. It was noteworthy that subgroup A^2 was found in 2.75% of the subjects, since absence of the blood agglutinogen A^2 has been considered as one of the anthropological characteristics of the Mongoloid race to which the American aborigines are thought to belong. The interpretation of this finding remains conjectural, but the clue might lie in the fact that the race is not absolutely pure. All but one of the subjects were Rh-positive. This explains why erythroblastosis fetalis is never seen among Andean people. As to the MNSs system, investigated in 500 of these subjects, 43.2% belonged to group M; 11.8% to group N; and 45.0% to combination MN.

Chronic Benign Neutropenia.—Chronic benign neutropenia was first described by Fanconi in 1941. It is characterized by a marked, chronic, selective drop in the neutrophil count resulting in leukopenia, normal bone marrow, decreased resistance to infections without significant impairment of the general health, unresponsiveness to the usual measures used in the treatment of granulocytopenia, and spontaneous cure. Less than 20 cases have been reported, mostly by European workers. It may be confused with malignant neutropenia, granulocytopenia, and chronic familial neutropenia. The first two of these is characterized by a severe leukopenia (3,000 or less) and bone marrow which shows arrest of the blastic myeloid series. In chronic familial neutropenia, adenopathies and typical granulations in the leukocytes are observed. Cyclic neutropenia is diagnosed by the appearance of granulocytes in the blood. Infectious mononucleosis may be associated with leukopenia with a relative lymphocytosis in some patients, but these lymphocytes display distinct features, and other aspects are very characteristic so there should be little confusion with this disease. Eosinopenia is a bad prognostic sign in chronic benign neutropenia. The cause is unknown. The evidence points to a shorter life-span rather than an arrest in the maturation of the neutrophils. No treatment has been found of benefit although splenectomy has been tried.

A further case was reported by Dr. Hugo Cedrón (*Patologia clinica,* vol. 2, September-December, 1957) in a 3-year-old girl who entered the hospital in August, 1957. Six months prior to admission an abscess formed on the posterior aspect of her thigh with symptoms of general infection, and despite intense antibiotic therapy it required 20 days to heal. Shortly after this, abscesses formed in the neck, upper eyelid, and other regions. All of them yielded only to prolonged treatment with antibiotics. Pustules also formed in the mouth and were accompanied by fever and general distress. When they healed, bronchitis with fever, cough, and profuse nocturnal sweating occurred. This process followed a relapsing course with ultimate recovery, but furunculosis and pyoderma recurred. On admission a roentgenogram of the chest showed evidence of bronchopneumonia. Serum electrophoresis revealed albumin 2.7 Gm. per 100 cc., alpha-globulin 0.9 Gm. per 100 cc., beta-globulin 1.2 Gm. per 100 cc., and gamma-globulin 1.9 Gm. per 100 cc. The albumin-globulin ratio was 0.68. The red blood cell count was 3,400,000 and the leukocyte count 6,000, with 1% neutrophils, 6% eosinophils, 26% monocytes, 65% lymphocytes, and 2% Turk cells. The sedimentation rate was 32 mm. and the hemoglobin level 9.6 Gm. per 100 cc. A biopsy specimen of bone marrow revealed hyperplasia of the myeloid series, with a predominance of myelocytes, a diminution in the elements of the erythrocyte series, a notable increase in eosinophils, and a normal appearance of the remaining bone marrow cells. Biopsy specimens from a cervical lymph node showed a nonspecific chronic lymphadenitis.

UNITED KINGDOM

Factors Influencing Deposition of Lipid on Aorta.—A chance observation by Rutstein and co-workers (*Lancet* 1:945, 1958) led to the study of factors affecting lipid deposition in tissue cultures of cells from the human aorta. In studying the effect of steroids on sodium and potassium exchange in human heart cells in tissue culture it was found that cells exposed to cholesterol for eight days took up this substance, which could be demonstrated histochemically. With tissue cultures of cells from the human aorta it was observed that the addition of cholesterol in alcohol resulted in deposition of the lipid in the cells, the amount being proportional to the cholesterol added. At a concentration of 1 mg. per 100 ml., little intracellular cholesterol was deposited. Deposition occurred at a concentration of 3 mg. per 100 ml., with an increase in the size of the cells, and at 5 mg. per 100 ml. there was a marked uptake, the cells being enormously increased in size. Similarly when cholesterol bound to beta-lipoprotein was added to the culture medium, the amount of lipid deposited in the cells was proportional to the amount of cholesterol added. The necessary concentration in this case was 50 to 70 mg. per 100 ml. The deposition of cholesterol was reversible in five days by replacing the cholesterol-containing medium with the normal tissue-culture medium. It was also inhibited by the simultaneous addition of linolenic acid, in a concentration of 1 mg. per 100 ml., and increased by adding stearic acid in the same concentration This technique is being applied to the testing of possible mechanisms of atherosclerosis, based on abnormally high levels of lipid constituents in the serum.

ECHO-Meningitis.—Aseptic meningitis ("nonparalytic poliomyelitis") can be caused by both poliomyelitis viruses and the group-B *Coxsackie* viruses Cases of aseptic meningitis due to ECHO (enteric cytopathogenic human orphan) virus type-6 have been reported in the United States. Jamieson and co-workers (*Lancet* 1:581, 1958) described an outbreak of aseptic meningitis in East Scotland due to ECHO virus type-9. Thirty-two patients were hospitalized in Dundee with aseptic meningitis, and reports from general practitioners indicated that many more patients were being treated at home. The time between the onset of illness and hospitalization was four to six days, the probable incubation period. The main clinical features were pyrexia, headache, vomiting, stiff neck, Kernig's sign, muscle pain, eye pain, abdominal pain, drowsiness, irritability, and giddiness. The onset was usually sudden, and a combination of pyrexia, headache, vomiting, and signs of meningeal irritation was the most common presenting syndrome. Pain on moving the eyes was a definite feature in a few patients.

Lumbar puncture was done on hospitalization and repeated at weekly intervals. The spinal fluid was generally under reduced pressure, varied in appearance between turbid and clear, and varied in its cell content, some specimens approaching 1,500 cells per cubic millimeter. The spinal fluid was usually normal by the 14th day. During the first four days there was an excess of polymorphonuclear cells. Later lymphocytes usually predominated. The protein level was usually less than 100 mg. per 100 ml. The white blood cell count was less than 10,000 in 18 patients and from 10,000 to 15,000 per cubic millimeter in 10. A stool and a sample of blood were obtained from each patient Cytopathic agents were isolated from five stool specimens in monkey-kidney cells. Poliovirus was absent from the stools. Antiserum neutralized the prototype ECHO-9 (Hill) strain. Rising titers of antibody to ECHO virus type-9 were observed in the serum of 22 of the 24 patients examined. There was often a familial association between the patients or evidence from the case history of contact with the disease. The initial severity of the illness was in contrast with the subsequently benign course in all the patients.

Refusal of Medical Care on Religious Grounds.—A warning was given by a London judge to parents belonging to Jehovah's Witnesses for failure to permit a blood transfusion to be given to their newborn baby. Refusal was on religious grounds. They were subsequently charged with the baby's manslaughter. The family physician in evidence said that he had advised blood transfusion but did not warn the parents that the child would die if it did not receive it. On account of this the judge dismissed the case. He told the parents that should a similar thing happen again they might find themselves guilty of manslaughter. The existing law is that it is an offense to cause unnecessary suffering to a child by wilful neglect and that if such neglect results in death the parent or guardian may be guilty of manslaughter. It is wilful neglect to deny proper medical attention, even on religious grounds.

Aphthous Ulcer.—Aphthous ulceration of the mouth is a common but intractable condition in Great Britain, affecting about a million persons. Hitherto treatment has been unsatisfactory. Truelove and Morris-Owen (*Brit. M. J.* 1:603, 1958) reported the satisfactory treatment of 52 such patients with tablets containing 2.5 mg. of hydrocortisone hemisuccinate. These tablets, with a special slowly disintegrating lactose base, were placed in close proximity to the ulcerated area and allowed to dissolve slowly over a period of about 45 minutes. Four tablets a day were used. Pain was relieved by the time the tablet dissolved, and the ulcers healed within 48 hours. If treatment was started when the ulcer was small (1 to 2 mm. in diameter) the ulcer did not develop but remained small and disappeared within 24 hours. Of 43 patients with minor aphthous ulceration treated with these tablets, 42 responded rapidly; 22 with severe ulcers had mild recurrent attacks.

Long-term Results of Vagotomy and Gastroenterostomy.—The long-term results of vagotomy combined with gastroenterostomy for the treatment of duodenal ulcer and a comparison of the results of this operation with gastrectomy were studied by Burge and Pick (*Brit. M. J.* 1:613, 1958). A series of 301 patients operated on between seven and nine years earlier were followed up. The recurrence rate was 4.25%, which could be partly explained by incomplete nerve section. This figure compared well with the reported rates of 2 to 6% after partial gastrectomy. From the point of view of nutritional state, anemia, weight maintenance, and ability to perform heavy work subsequently, combined vagotomy and gastroenterostomy gave better results than gastrectomy. After gastrectomy the incidence of microcytic anemia increased with each passing year. After vagotomy and gastroenterostomy only 2% of the patients investigated had a hemoglobin level below 85%; 30% of this group, however, had loose stools. The incidence of the postcibal dumping symptoms was 16% and of bilious regurgitation 13%, both figures comparing favorably with those found after gastrectomy. In another series of 100 patients the operative mortality was nil, compared with 2% for gastrectomy in expert hands.

Burge and Pick concluded that combined vagotomy and gastroenterostomy is the operation of choice for either sex and at any age when surgery is indicated for chronic duodenal ulcer. They believed that some of the unsatisfactory results might be due to incomplete nerve section, and they devised a method of testing for this during the operation. This depends on recording the effects of va-gal nerve stimulation on gastric motility. A large-bored cuffed rubber tube connected to a pressure recorder is passed through the mouth into the stomach, the esophagus is sealed off by blowing up the cuff, and the pyloric antrum is lightly clamped. After the stomach has been filled with water the vagus nerves in the neck or around the esophagus are stimulated with platinum electrodes. With the vagus nerve fibers intact stimulation results in gastric contractions and in a rise in intragastric pressure. After complete section of the vagus fibers electrical stimulation ceases to cause a rise in the intragastric pressure.

Staphylococci in a Surgical Ward.—The *British Medical Journal* of March 15 reports a severe outbreak of staphylococcic infection in the summer of 1956 on a surgical ward at St. Bartholomew's Hospital. Staphylococci of a single phage type caused 31 infections in two months. The organisms were spread in part by a member of the surgical team who was a carrier, but there was also evidence of spread within the ward. Many staphylococci found in the air and on the bedclothes in the ward raised the question of the importance of air-borne transfer in the spread of infection within the ward, and of the value of evaluating the air and dust contamination with staphylococci. In an eight-month survey 17 (5.5%) of 311 patients admitted to a general surgical ward developed staphylococcic wound infection, pneumonia, urinary infection, or enterocolitis while in the ward. Only one of the eight cases of wound infection was attributable to infection in the operating room.

The reservoirs of staphylococci in nasal carriers, on inanimate objects, and in the air were examined regularly, and staphylococci from all these sources, and from patients' wounds, were examined for bacteriophage type; 186 different types of Staph. pyogenes var. aureus were identified, but only 13 of these caused disease, and only 3 were responsible for disease in more than one patient. The air and dust sampling revealed nine occasions when staphylococci of a single phage type reached the level of 0.1 particle per cubic foot of air. These were due to seven types of staphylococci. The three types that were present in the air in the greatest numbers failed to cause any manifest secondary infections. This, and the fact that so many types of staphylococci caused no disease, suggested that some staphylococci were more virulent than others. Several of the staphylococcic disseminations could be attributed to patients with infected lesions who were peculiarly apt to disperse organisms, such as those with an infected tracheotomy wound, infected urine in an incontinent patient, or an infected wound requiring frequent redressing. Patients infected with tetracycline-resistant staphylococci were, when possible, nursed in a side-room. This limited the spread of their infection. Ten patients (with four types) were nursed in isolation, and only one patient with a secondary case appeared in the ward

Remuneration of Doctors and Dentists.—The Roya College of Surgeons of Edinburgh issued a memorandum which stated that the National Healt Service has led to an impairment of professiona dignity and deterioration in the doctor-patient relationship. It complains that medicine has bee made a less attractive profession, with distinc trends toward a leveling mediocrity, and suggeste (1) upward adjustment of salaries in conformit with the increased cost of living; (2) reasonabl allowances for professional expenses; (3) encouragement of private enterprise in practice, research and training; (4) an increase in the establishment o surgical consultants; and (5) new hospital building and equipment.

The supplement to the *British Medical Journa* of March 15 stated that the existing channels o negotiation are inadequate for settling disputes o major financial importance and recommended tha medical remuneration should be the subject of a annual review and report by a standing committe appointed by the Prime Minister, whose terms o reference and composition should be agreed with th profession. Once remuneration has been agreed, i should remain unchanged for a period of three years

WORLD HEALTH ORGANIZATION

Diseases in Retreat.—In the 10 years since th founding of the World Health Organizatio (WHO), intensified efforts have forced communicable diseases into retreat over a wide front. I countries with well-developed public health services, such diseases as diphtheria and whooping cough and, in some cases, even tuberculosis have ceased to be important public health problems Great scourges of tropical and subtropical areas such as malaria and yaws have been attacked vigorously. Parallel with the retreat of the more commonly known communicable diseases in countries with highly developed health administrations, other diseases, such poliomyelitis, cancer, and cardiovascular and mental diseases have become more serious. No sooner do certain diseases appear to be succumbing to control methods than, unexpectedly, they acquire a new lease on life through the adaptive ability of either the organism that causes the disease or the vector that carries it. In 1955 WHO called on member states to join a world-wide malaria eradication campaign. At present, malaria eradication has been nearly achieved in 9 countries or territories, is under way in 51 others, and has been initiated or planned in 16 more, with an aggregate population of 1,156 million, representing 73% of the total population of countries where malaria is, or has recently been, a problem.

Yaws, a nonvenereal disease, is wide-spread in tropical areas. Mass campaigns have been launched in more than 20 countries and territories. By the end of 1958 it is estimated that half of the 200 million people living in areas where yaws is prevalent will have been examined, and 25 million will have received injections of long-acting penicillin, at a cost of between 10 and 15 cents a person. Among those examined, the 15 million with the disease in an active form will have been reduced to about 500,000. With the prospect that yaws may ultimately be eradicated from rural areas of many countries, the emphasis of WHO programs will shift to the attack on venereal syphilis in the urban areas. In the case of tuberculosis, prophylaxis has played an important part in the 10-year period. In WHO's BCG vaccination campaign, over 200 million young persons were tested and nearly 90 million vaccinated in 58 countries. Due to the discovery of new antituberculosis drugs, emphasis has shifted to ambulatory chemotherapy and chemoprophylaxis which allow sufferers to remain at home while undergoing treatment. These methods are being tried in several pilot projects.

In the field of nutrition, much progress has been made in dealing with protein deficiency, especially in the diet of young children after weaning, by developing processed, protein-rich foods from local materials; particularly in countries where milk and milk products are not generally available. According to the United Nations Demographic Yearbook, life expectancy has increased almost everywhere in the world. In the more developed countries, a newborn girl can expect to live 4 to 5 years longer now than 10 years ago, a newborn boy 3 or 4 years longer; and in some of the countries undergoing rapid development, life expectancy at birth has increased up to 11 years for girls and 10 years for boys.

When WHO came into being it took over the responsibility for the administration of the existing international sanitary conventions but, since there was no uniformity and certain of the regulations were excessively strict, these conventions were replaced by a single code, the "International Sanitary Regulations," which came into force on Oct. 1, 1952. The new regulations are designed to give the greatest protection against the spread of epidemic disease with minimum interference with travel and trade; 145 states and territories have accepted these regulations without reservations and 22 with reservations that were found admissible by the World Health Assembly. The epidemiological intelligence service, which warns of the occurrence anywhere of such quarantinable diseases as plague, cholera, yellow fever, smallpox, typhus, and relapsing fever has been greatly strengthened and expanded since 1948. Daily bulletins are transmitted by short-wave radio from Geneva to all parts of the world so that not only public health authorities everywhere, but also airports, ports, and ships at sea can pick them up. In addition, a printed weekly epidemiological record, including statistics on many important diseases, is given world-wide distribution by air mail from Geneva.

Another service rendered to governments by WHO was the publication of the "International Pharmacopoeia," the first volume of which appeared simultaneously in English and French in 1951, and the second in 1955. Both are also published in Spanish editions. The "International Pharmacopoeia" contains specifications for 400 pharmaceutical preparations which are recommended to serve as a basis for the establishment of national specifications. In the field of biological standardization, WHO has established 50 new standards since 1948, ranging from diphtheria antitoxin to a whole series of antibiotics. In this work more than 100 laboratories in different parts of the world have cooperated.

With advancing industrialization, man increasingly modifies his environment and, in so doing, inevitably creates new health hazards. WHO is concerned to assist the countries undergoing rapid development to avoid making the mistakes of the first industrial revolution. The most striking example of man-made health hazards is the problem of radiation hazards and radioactive waste disposal which accompanies the growth of the peaceful uses of atomic energy. In 1955, an expert was appointed to the staff of WHO to advise the Director General on atomic energy in relation to health, and later that year WHO, in collaboration with the Government of Sweden and the Atomic Energy Commission of the United States, sponsored the first international training course for health physicists ever to be held. This was followed by another course in Belgium in 1957, and in the United Kingdom and France in 1958. The present program of WHO in this field includes (1) training for three distinct categories of workers: specialists for protective work in atomic energy laboratories or plants (normally either physicians or health physicists); public health administrators who would be particularly interested in such questions as the disposal of radioactive waste and the siting of reactors; and medical users of radioisotopes; (2) collection and distribution of information on the medical problems of atomic energy and on the medical uses of radioisotopes; (3) study of the health problems involved in the location of reactors and in the disposal of radioactive waste from factories, laboratories, and hospitals; (4) cooperation with the competent technical bodies on the standardization of radiation units, codes of practice such as the recommendations of the International Commission on Radiological Protection, and the pharmaceutical specifications of methods of preparing radioisotopes for medical use; and (5) coordination of research on the health aspects of radiation.

LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Malpractice: Breach of Contract to Perform Cesarean Section.—This was an action for damages for a breach of the defendant osteopath's agreement to deliver the plaintiff's child by means of cesarean section. From a judgment in favor of the plaintiff, the defendant appealed to the Supreme Court of Michigan.

The plaintiff, a 37-year-old woman, had become pregnant and was disturbed and apprehensive that she might not be able to carry the child to term. She had had two previous stillbirths and was convinced that she could not normally deliver. Consequently, when she and her husband consulted the defendant, an osteopathic physician and surgeon, they told him they "thought that a cesarean operation would be absolutely necessary." In fact, the plaintiff's husband testified, "We demanded that Dr. Bunyan perform a cesarean operation." The doctor replied that he was not qualified to perform it but that he would see to it that Dr. Kesten (the operating physician in the hospital) was available and that a cesarean would be performed. The plaintiff was as clear and positive on the subject as her husband. She said, "We told him we wanted it taken; he said I would labor for a while and that the other doctor would take—Dr. Kesten would take." The plaintiff and her husband discussed the cesarean at the time of each visit to the defendant's office. The defendant himself testified, "I knew Mrs. Steward wanted a cesarean. I knew also of the possible problems in the delivery of this child." In the latter part of June the defendant recommended that the plaintiff go to an x-ray specialist. The specialist reported that the baby was 8 months in development and suggested obstetric consultation because of the plaintiff's age. Early in August more x-rays were taken, which indicated that the plaintiff was only about two weeks from term. Obstetric consultation was again recommended, but none was had. On Sept. 4, labor pains were felt and the plaintiff went to the defendant's office. She thought she was more than a month overdue and she asked why the baby had not been taken at the right time. The defendant told the plaintiff and her husband not to worry and to go back home. He testified that the baby was alive at that time. The next morning she returned to the hospital. No fetal heart tones were heard. Nothing was done for her until the early afternoon, and at about 10 p. m. that night she was delivered of a dead child.

In the opinion of the court, there was no doubt that the defendant had contracted to perform a cesarean or to see that one was performed. The defendant, however, contended that damages for grief and sorrow were too remote to support a judgment. It is true in the ordinary commercial contract, said the court, that damages are not recoverable for disappointment, amounting to alleged anguish, because of breach. Such damages are, in the words of defendant's requested charge, "too remote." But these are contracts entered into for the accomplishment of a commercial purpose. Pecuniary interests are paramount. When, continued the court, we have a contract concerned not with trade and commerce but with life and death, not with profit but with elements of personality, not with pecuniary aggrandizement but with matters of mental concern and solicitude, then a breach of duty with respect to such contracts will inevitably and necessarily result in mental anguish, pain, and suffering. In such cases the parties may reasonably be said to have contracted with reference to the payment of damages therefor in event of breach. Far from being outside the contemplation of the parties they are an integral and inseparable part of it. In the case before us, asked the Supreme Court, can any reasonable person doubt that mental pain and suffering were within the contemplation of the parties in the event the plaintiff were damaged by breach? Is any other contemplation, in fact, within the scope of the facts established upon trial? Here we have a couple, no longer young, who are convinced their their only chance for life is through the cesarean section. The demanded operation was not a trivial and subordinate aspect of their agreement. It was of the essence thereof, the sole reason for its being, the indispensable ingredient. There was not an iota of the commercial in their contract. Tragedy, they felt, would again visit them, were they not to have the safeguard of skillful surgery rather than the uncontrolled processes of nature that had proven doubly disastrous in the past. We know now that the hour of delivery having come, and gone, without the intervention of the surgeon's skill, again the plaintiff felt the exquisite cruelty of hope destroyed and life denied. It is not disputed that the suffering existed.

Finally, the defendant contended that the plaintiff did not show that the death of the baby was caused by his failure to have a cesarean section performed. First of all, said the court, the jury was justified in finding that the baby was alive, with a strong fetal heart beat, on the morning of Sept. 4th, when the plaintiff and her husband went to the defendant's office, expressing concern that delivery "was not made at the regular period." The jury also knew that the mother's full term had run, that the long wait was over and the hour of delivery at hand. The jury knew, in addition, that the plaintiff's pains had commenced, that they persisted, and that within hours, in fact, she was admitted to the hospital and delivered of a dead child. They would be justified in finding, on these facts, that if the plaintiff had been sent to surgery instead of back home on the morning of Sept. 4th her baby would have been delivered alive. There is, of course, no absolute certainty thereof. The knife might have slipped or the child might have died at any instant because of forces beyond our control, beyond, possibly, even our comprehension. But absolute certainty we do not demand, said the Supreme Court, particularly where there can be no certainty from the very nature of the case. The jury's calculus does not demand certainties but only probabilities. As we observed, the court continued, the defendant misconceived the legal issue. The burden was not upon the plaintiff to show that the failure to operate "caused" the loss of the baby. The plaintiff's burden was less. It was her burden to show to the jury with reasonable certainty that if the defendant had caused the operation to be performed in accordance with his agreement, the surgeon would then have delivered, alive, the baby, whose strong and normal heart tones were so clearly audible. In the opinion of the Supreme Court, the plaintiff bore this burden of proof.

Accordingly the judgment in favor of the plaintiff was affirmed. *Steward* v. *Rudner*, 84 N.W. (2) 816 (Mich., 1957).

MISCELLANY

SOCIAL SECURITY AND THE UROLOGIST

William J. Baker, M.D.

I am not an expert in economy. I am an economic coward; I have most of my savings in Illinois farm land just so I can look at it. However, I believe that any country worth living in is worth fighting for. I have a firm and loyal belief that we have a great country. I also have a fear that we are in the process of making some mistakes which have destroyed or weakened other countries. As a matter of fact, I, like most busy clinicians, felt that all physicians should be included in the social security coverage and taxed accordingly. However, it has been learned that there are many reasons why physicians and many other individual self-employed people should not be a part of this socializing, compulsory tax scheme of a fast developing welfare state.

Persons in nearly all kinds of work are now covered by social security. Important exceptions are the railroads with their own retirement systems, employment in most federal jobs covered by the government's own retirement plan, and self-employment as in the case of a doctor of medicine. Employees of state and local governments and nonprofit organizations are covered by the law only if certain conditions are met. Inasmuch as we are almost the last segment of our population to avoid this tax and all of its projected implications and inasmuch as we still have the right of free speech, let us talk about social security, its early history, what it has and has not accomplished in the past two decades, what it would mean to physicians, and what it has done and might do to our national economy in the future.

We need to think about these facts of social security because it has been a part of American life since 1935. It is big business. It is an ever-increasing compulsory taxation. Currently 73 million workers are covered under social security, with 10 million persons receiving benefits. It is almost astonishing that there were only 35 million insured workers and 200,000 beneficiaries in 1941. Moreover, maximum monthly payments have more than doubled since 1950. The taxes which workers and employers pay into the fund, to the extent that the taxes are not required for current withdrawals, are spent by the government for its general needs, but the government gives the fund its I.O.U.'s in the form of government bonds. Somebody has to be taxed to produce cash for a government bond. In the fiscal year ending June 30, 1957, the fund's receipts totaled 7,159 million dollars and its expenditures 6,723 million dollars. The year 1958 will see one billion dollars more spent in benefits than will be collected by social security taxes.

Why was a Social Security Act needed in the first place? Why should we provide for that segment of the population who will not work or save? The answer is that, of this segment, a certain percentage has never been fortunate enough to have a gainful occupation in order to save for retirement. Too, many workers were retired, due to age, when they were quite capable, mentally and physically, to continue work but had no funds to support themselves.

Previous to the Social Security Act, we can all remember how workmen would be discharged just prior to their time for a pension, or they would reach retirement age and have no funds on which to subsist. Even now, many industrial and business concerns have compulsory medical care programs by a full-time medical department in order to weed out the physically unfit prematurely so that the amount of pension or retirement money can be reduced. The employee is not permitted to complete the time element of his contract. Let us repeat that the Social Security Act was written to protect any person who came to the end of his working days and had no savings or funds.

The difference of opinion as to whether physicians should be covered under social security arises because physicians lack information, or are confused, or believe entirely in a welfare state. Too,

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President, American Urological Association.
Read before the New York Urological Society, Nov. 20, 1957.

many young and middle-aged physicians, especially those with large families (all of them having worked while very young in college and medical school), are afraid that increasing taxation of all kinds and inflation will prevent them from ever saving enough for retirement, disability, or even educating their children. So, social security benefits look very attractive to them. In the face of sputniks and lovers of the welfare state, this group of physicians have a potent argument.

In 1949, after due deliberation, the A. M. A. House of Delegates voiced active opposition to the compulsory inclusion of physicians under the Social Security Act. This opposition has been voiced repeatedly ever since. However, in 1954, knowing that some doctors wanted to be included, the A. M. A. Board of Trustees expanded its position to remove any objection to the voluntary inclusion of physicians under social security. Only three states favor compulsory coverage (New York, Pennsylvania, and Massachusetts). Organized medicine believes that compulsory inclusion of physicians under social security will create a leveling process, which, when combined with ever-increasing taxes, will inevitably tend to destroy individuality and initiative. If we, as a group, can show the people that we can do a better job of taking care of ourselves than can be done by delegating our respon- ibilities and opportunities to the government, then have won a magnificent battle in the never-

Congress now would raise the base to $4,800 this year. There is nothing in the law that prohibits Congress from raising this figure each year. As a matter of fact, the $6,000 base has been mentioned in Congress for 1958, with a 6% rate of tax. The present amended bill for social security has increased the base amount to be taxed to $6,000 and the rate of taxation to 6% to begin in 1958, but it also carries a rider that anybody who is enjoying benefits under the act will have all medical, dental, ocular, and hospital bills paid for by the government. This is alarming, and one can see the next step of complete socialized medicine. This rapid increase in base and rate of tax and fringe benefits by the politicians is alarming because of actuarial instability. It is more alarming from another point of view. This is a compulsory tax. It is an encroachment upon personal and private affairs. It sets the pattern of social insurance, which in other countries has progressed from retirement payments to survivorship payments, then to permanent and total disability payments, then to temporary cash sickness benefits, and finally to national compulsory health insurance. It is clear, too, that greater federal control and the placing of responsibility for an increasingly greater percentage of our people into the hands of the government will result in the loss of freedoms which can neve [illegible] laimed. For these reasons, the House of D [illegible] f the American Medical Association on [illegible], recommended that resolutions, wh [illegible] compulso

What do you get for what you pay? As of December, 1952, retired Old Age Survivor Insurance beneficiaries had received and would receive an average of $24 in benefits for each 50 cents they had paid in taxes while they were working. The 1954 amendments increased that ratio to $30 in benefits for each 50 cents paid in taxes. The 1956 amendments will bring another sharp rise in this ratio. Many lawmakers of both major parties plan drives for another liberalization of social security to keep pace with inflation. Proponents of large social security payments are not dismayed by the deficit now existing in social security funds. They favor increasing the base which is taxed.

What is the condition of the Social Security Trust Fund? The liabilities for current and future benefits are now estimated at over 361 billion dollars. After two devastating wars—one rather expensive one—and 20 years of the New Deal, we had managed to accumulate a government debt of over 280 billion dollars. In 20 years of social security, the government owed in connection with social security alone over 360 million dollars, or more of a debt than we have been able to build up in all other ways in the entire history of our country. However, less than 7% of this estimated liability is theoretically backed by reserve funds. The so-called Old Age Survivors Insurance "trust fund" contains approximately 21 billion dollars. These are in the form of United States government bonds. In other words, the fund has in it 21 billion dollars worth of government I. O. U.'s. Most of the social security tax monies have been used to pay other government expenses over the past 20 years. Furthermore, the interest and eventual retirement of the "trust fund" bonds will have to be paid out of general tax funds—mainly income tax funds. This is deficit financing and a dangerous national disease.

Physicians and Social Security Benefits

Physicians who are proponents of social security emphasize the necessity for old age payments to doctors. The vast majority of self-employed physicians "die with their boots on." They do not consider 65 or 72 as an automatic retirement age. About six of seven doctors in the 65-to-75-year age group are still in private practice. Over half of the physicians who do retire wait until after the age of 74. Thus, the average physician who would be forced into the Old Age Survivors Insurance program would have to pay taxes until the age of 72, without receiving any benefits. Between the ages of 65 to 72 he could receive no benefits if he earned more than $1,200 a year.

Dr. George Cahill of New York City writes that the Society for the Relief of Widows and Orphans of Medical Men, the Physicians Mutual Aid Society, the Fund of the County Medical Society of New York, and the Home for Elderly Physicians all protect New York City doctors, their widows, and their children quite adequately. According to Fred Slobe, M.D., of Chicago, Ill., only 43 doctors and widows are current beneficiaries of the medical benevolence fund of the Illinois State Medical Society.

Physicians who are inclined to favor inclusion in the social security program use as their most powerful argument to younger physicians the survivorship benefits of the program. Let us look at the real value of these touted benefits.

1. A widow with no dependent children under 18 receives no survivorship benefits. She must wait until she is 62 years of age to get her reduced benefit of $81.40 monthly or until 65 years of age to get her full benefit of $108.50 monthly.
2. A widow with dependent children receives survivorship benefits only until her youngest child reaches the age of 18. Thus, there is a so-called blackout period between the time her youngest child reaches the age of 18 and the time she reaches the age of 62 or 65. For example, a woman whose youngest child was born when she was 30 years old would receive no benefits after the age of 48. The period of no social security income would be 14 years to age 62 and 17 years to age 65.
3. A widow loses all her survivorship benefits if she remarries. This situation and the coverage gap described above can be avoided in contractual agreements between an individual and an insurance company.
4. The maximum survivorship benefit is $200 monthly for a widow with two or more children under 18. A widow with only one child would get $162.80 a month. Equal or greater benefits for a wife and children can be purchased through private insurance companies and at less cost than the amount of social security taxes.

The current tax is 3⅜% on $4,200 for the self-employed. The tax on the self-employed in 1975 will be 6⅜%, or $267.75 a year. Any so-called bargain features of survivorship coverage must be viewed in the light of future tax increases and also the costs of private insurance. For example, a 25-year-old physician, for an extra annual premium of about $65, can obtain a family income clause in a $20,000 ordinary life insurance policy. This would pay his family $200 a month during the interval between his death and the 20th anniversary of the policy. At that time the $20,000 would be payable to the widow.

The same protection can be obtained by a 30-year-old physician for about $85 a year, by a physician 35 years old for about $115 a year, and by a physician 40 years old for about $166 a year. A 10-year family-income clause would cost an extra annual premium of about $60 for a physician at the age of 40 and $83 at the age of 45. Moreover, the extra annual premiums for family income terminate after a specified period of time of 10, 15, or 20 years. The above facts are very important to younger physicians who have been told that "You cannot buy cheaper life insurance than social security." They are told: "Everybody else is on the gravy train; why shouldn't we hop on?" They are also told that "Those old fogies in the A. M. A. made their bundles when they could salt it away; now they're the ones who are keeping us out of social security." As far as I am concerned, these statements are not based on facts.

We have heard repeatedly that when we join the social security club we get almost $37,000 of life insurance coverage. This fact is stressed time and time again. One should keep in mind that to qualify for this maximum family coverage with the least expense, one must first pay maximum social security taxes for 18 months. The next day your wife must give birth to twins and you must die. Even the shock of twins is unlikely to cause your sudden death, but let us pretend that it does. Your widow and twins would be paid survivors benefits of $200 a month for 18 years, or $36,920. Unfortunately, one must read the fine print. Your widow has to apply for the survivors benefits. She may be attractive enough to remarry, but if she does, she becomes ineligible to receive benefits. If either child marries, he gets no benefits. As soon as your twins become 18 years old, all benefits to them and to your widow stop. She gets nothing then until the age of 65, when she might become eligible to receive $81 a month. Most self-employed physicians earn at least $5,000 a year. Therefore, it is quite likely that you would have paid the maximum social security taxes for the 18 months before you died and the twins arrived. You would have paid $189 for 1956 and half of 1957 under present rates and base. As a young physician you can buy much better guaranteed coverage for your family from private insurance companies.

Furthermore, the young doctor's chance of ever collecting retirement benefits from the government is very poor. He must survive to the age of 65. To collect maximum monthly retirement benefits, he and his wife must survive and both must be 65 years of age or over. To collect any retirement benefits, he must earn less than $2,080.01 a year, at least until he reaches the age of 72. To collect maximum retirement benefits, he must earn less than $1,200 a year until the age of 72.

How likely are you to survive to the age of 65? If you are 20 years old now, your chance of surviving to age 65 is 61%. If you are 25, your chance of surviving to age 65 is 62%. If you are 30, your chance is 63%. If you are 35, your chance is 64%. If you are 40, the figure is 65%. If you are 45, your chance of surviving to the age of 65 is 68%. It is easy to deduce from these figures that about 63% of all physicians, if included by law, would pay into social security. Since one in seven of us retire, the rest of us would be paying for the 2% who would ever benefit from these compulsory taxes.

Is Social Security Really Insurance?

The propaganda to enlarge the scope and payments of social security is tremendous. The public reads the numerous booklets and is much impressed by the terms Retirement and Disability Insurance Payments, or Survivors Insurance Payments. The word insurance has sold the idea of social security to thousands of people. Is social security really insurance? In 1934, only a year before the Social Security Act became law, the U. S. Supreme Court rebuked the 73rd Congress for trying to get out of the veteran's insurance contracts issued in World War I. Mr. Justice Brandeis cited the doctrine that "the United States are as much bound by their contracts as are individuals."

In 1937, the Attorney General, in defending the constitutionality of the Social Security Act before the Supreme Court, stated that social security benefits "are gratuities to be paid by the national government directly to individuals. The act creates no contractual obligation with respect to the payment of benefits." The whole program was justified to the Supreme Court on the public charity-general welfare theory. And on that basis, the Court upheld the constitutionality of the Social Security Act. However, the social security administration reasons that the general public is fickle and soon forgets. All of their literature alludes to social security as insurance, and the public believes this. Let me emphasize, over and over, that social security is not insurance. The "premiums" exacted are not voluntary; they are compulsory. The benefits are not stable. They are liable to go up or down, whenever the Congress wishes. The Social Security Act is also qualified by fine print which people do not read or know about. The law compels employers and employees and the self-employed to pay taxes. The law guarantees nothing in return. Why should the proponents of social security want the American public to think of social security as insurance? Can you think of a better way to sell a paternalistic or socialistic scheme of compulsory taxation to a traditionally independent and democratic people than to make its title and terminology in the peoples' minds, the same as insurance, one of our oldest and most honored and stable institutions? A 1956 booklet on "Your Social Security" scatters the following insurance terms throughout its contents for the American people to read: becoming insured, old age insurance benefit, beneficiary, spouse of an insured worker, and insured person.

Inasmuch as social security is not a written contract with the individual and does not cover a specified risk, nor is the premium proportioned to the risk involved, social security is not insurance as we know it. In first place there are no specific guaranteed rates, nor are there any specific guaranteed benefits, as both rates and benefits are dependent on legislation now and in the future. Nor do various persons pay a different premium in proportion to the risk involved as they do in life insurance. A young man in his 30's with several children pays the same amount for a period extending to age 65 as does the man now 60 with no children or dependents.

Yet, the young man has several possibilities of benefits being paid to himself and/or to his dependents, whereas the older bachelor has only the chance of collecting an income for his lifetime commencing at age 65 and then only if he abides by certain rules in his retirement program. If both earn the maximum of $4,200 annually, the young man's widow has an opportunity of collecting $200 per month until the oldest child reaches 18, and then upon her attaining age 65 she can collect for her lifetime $81.40 per month. For this coverage the self-employed today pay 3⅜% of $4,200 or $141.75 per year. In the case of the insurance company it makes no difference whether the insured retires or doesn't retire; the benefits would be paid regardless of whether or not he had a wife and children or whether he left no dependents.

The premium on insurance is a guaranteed premium, cannot be more, could possibly be less, is a specific contract between the individual and the insurance company, and guarantees payment either at death or at age 65. The 3⅜% is merely the current tax being charged by the social security board and the tax being levied under the 1956 act, and the benefits are those currently authorized in the latest social security legislation, the benefits can go up or down, the rate can go up or down, and, of course, the likelihood is that it will go only one direction—up.

Cost of Social Security

When the government provides something to one group for less, then part of the cost must be paid by some other group. Obviously, succeeding generations will have to pay this debt through higher social security taxes or through higher income taxes. A very good reason for the easy expansion of the federal benefit system lies in the fact that the tax burden falls very lightly on the present generation of workers and voters. We have the unique situation of the present generation legislating one rate of taxation for themselves today and a progressively higher rate of tax on the next generation to whom we look to pay our old age benefits. It does seem somewhat ridiculous and selfish to have the present generation of employed persons under 65 years of age, who constitute the majority of the voters today, voting larger and larger benefits for themselves, with any one individual and his employer, so far, having paid only 10% or less of the actual cost of the benefits he will get when he retires. The real cost of the scheme is deferred to the working population of the next generation in increased taxes of all kinds. One wonders whether this generation's desire to get a "secure old age" will keep us on friendly terms with tomorrow's young.

Our taxes are too high now. Social security inclusion would mean more taxes. Furthermore, unbiased study indicates that social security taxes must be increased. They will be increased faster than the advocates of social security will admit, because the "trust fund" is phony and not on a pay as you go basis. The already promised "benefits' and the politically expedient trend toward ever greater promises all add up to increased taxes in the too near future.

For the first time since the Social Security Act was passed in 1935, the government fund is today pouring out more money in benefits than it is collecting in social security taxes. Today, 73 million workers are covered under the program. That means that 9 out of 10 of us are either covered or eligible for coverage. This year, over 7,300 million dollars will be paid out by the fund in social security benefits. In 1941, by contrast, the first year that benefits were paid, the total paid out in benefits was 64 million dollars, an increase of over 7 billion dollars in 16 years. The reason that the fund is paying out so much more this year than was originally estimated is that almost 700,000 women have taken advantage of the change in the law in 1956 to allow women to begin drawing benefits at the age of 62, and almost 400,000 self-employed farmers are now qualifying for benefits. Furthermore, this past August, the fund started to pay benefits to the 275,000 or more of permanently and totally disabled persons who had reached the age of 50. Over 10 million people are now drawing benefits from the security funds.

The cost of administering the old-age, survivors, and disability insurance program during the fiscal year ending June 30, 1957, approximated $153,700,000. The average number of persons employed in administering the program was 27,800 at a cost approximating 126 million dollars. Administrative costs amounted to 1.9% of tax collections and 2.3% of total benefits paid. Information is not available on the number or amount of unclaimed social security checks. In the early years of the program, these checks were turned over to the general accounting office for disposition. Subsequently, the Bureau of Old-Age and Survivors Insurance was authorized to cancel these checks after a reasonable time, and the Treasury Department was instructed to return the funds to the proper trust fund.

The current session of Congress now has before it two identical bills (H. R. 9 and 10). The Jenkins-Keogh Bill, a pension plan for self-employed individuals, would allow self-employed persons an income tax deduction for limited amounts placed in a retirement fund. Similar legislation has been introduced in every session of Congress since 1951, but, unlike their predecessors, the present bills contain provisions generally acceptable to the life insurance industry. It is generally conceded that these newcomers have a better chance for survival. The American Bar Association, American Dental Association, American Institute of Accountants, and other similar groups have formed the American Thrift Assembly for Ten Million Self-employed to promote enactment of this legislation by Congress. Any self-employed individual under 50 years of age deducts 10% of his net earnings up to $5,000 for any one year. The maximum deduction for a life time is $100,000. These monies would be put in a restricted retirement fund under trust or custodianship or in a restricted retirement policy issued by a life insurance company. There are many paragraphs to describe the distribution of these retirement funds and the retirement insurance policies.

In summary, physicians as a group do not need social security. Too few ever retire. If the argument is used that from a humanitarian point of view we should be included, then we must admit that we believe in a total welfare state. The original purpose of the social security act has been lost, and the octopus of socialism is throttling us slowly but surely by its tremendous growth and extra taxation. Social security is not insurance and is not related to the principles of insurance in any way. Anyone in the same income group as physicians can buy much more insurance for family protection from private insurance companies than can be obtained from social security for the same amount of dollars contributed in the form of social security taxes. Social security, unlike insurance, has no cash value which can be used for financial emergencies. People are struggling everywhere for their God-given right to govern their own lives, make their own decisions, possess property of their own, work at a job of their own choosing, retain the major portion of their wages, and to provide for their own security. Physicians believe in this right of mankind. The right to provide for our own security will be taxed out of existence if Congress forces the medical profession into social security.

MEDICAL FILM REVIEWS

Transplantation of Homologous Parathyroid Gland: 16 mm., color, sound, showing time 18 minutes. Prepared in 1957 by Julian A. Sterling, M.D., Philadelphia. Procurable on loan ($3.00) or purchase ($100.00) from Ralph Lopatin Productions, 1920 Chestnut St., Philadelphia.

This film is interesting because the problem i illustrates is a practical one, and the management, i successful, would be worthwhile. It is confusing however, because of the poor presentation of th material. Further confusion is brought about by th statement that in two of the three cases presente the patients remained euthyroid, while in two cases uncertainty remained as to the success of the "take" of the graft and whether or not it is viable. With a problem as challenging as this one is, the viewer is eager to see clearly the technique and placement of the graft. But each time the technique was demonstrated, the picture was either too small or out of focus. This presentation falls more into the realm of experimental surgery than into that of a definitive approach to the subject of homologous grafting of thyroid and parathyroid glands. At this time, it cannot be recommended for such audiences as practicing physicians, students, and nurses. It can be recommended, however, to those interested in experimental surgery dealing with vascular anastomoses and gland transplants.

You and Your Ears: 16 mm., color, sound, showing time 8 minutes. Produced in 1956 by and procurable on lease or rental from Walt Disney Productions, 2400 W. Alameda Ave., Burbank, Calif.

In this film, the cartoon character Jiminy Cricket tells a clear story about the ears—their construction and how they function. The role of the outer, middle, and inner ear in relation to the function of hearing is explained in detail. Also explained is the part of the ears in helping the body maintain its sense of balance. This informative and entertaining film is an elementary outline of instruction on the ear. It is clever, colorful, and attractive and would be an excellent supplement to teaching this subject at the junior high school level. It would also be useful for doctors who are requested to speak to students of this age group.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Civilization, Race and Coronary Atheroma with Particular Reference to Its Incidence and Severity in Copperbelt Africans. J. B. Hannah. Central African J. Med. 4:1-5 (Jan.) 1958 [Salisbury].

In a brief historical review of coronary atheroma, Hannah points out that it is not peculiar to modern civilization. Examination of the preserved remains of ancient Egyptians has revealed that the number of sclerotic, partly calcified vessels was striking. Histologically, the arterial damage differed in no way from the degenerative arteriosclerosis of today and was frequently found in individuals who would not be called senile. Even if coronary atheroma is not new to civilization, in the western world it is becoming more frequent and more severe, especially in the ascending period of life. There seems to be something in the pattern of 20th-century life or diet which is responsible. This assumption would be strengthened by finding coronary atheroma to be much less frequent and much less severe in people who had not yet been drawn into the maelstrom of modern civilization. The Bantu peoples of central and southern Africa offer a fertile field for such a study. Many of them still live a primitive life, and others among them have only recently been absorbed into industrial civilization.

The incidence and severity of coronary atheroma in copperbelt Africans is recorded from a series of cases at Nkana Mine Hospital, and the results are compared with those from a contemporary European series. The Nkana Mine Hospital for Africans has 300 beds. The autopsy rate at this hospital is high, but between June, 1948, and September, 1953, not a single death could be attributed to coronary disease. During the same period, at the European hospital of 40 beds, 23 deaths were caused by coronary thrombosis. In an attempt to correlate these findings with the incidence and severity of atheroma in the 2 races, autopsies were conducted on 42 Africans and 22 Europeans who died suddenly from all causes. Of the 42 Africans, only 1 had severe coronary atheroma; the death of this patient was a typical coronary death with anginal pain. Two Africans had moderate lesions, and 4 had mild ones. The remaining 35 showed not the slightest trace of coronary atheroma. It was interesting to compare the stretchable, smooth, gray-intima of the vessels of the Africans with the unyielding, ocherous intima of specimens from like-aged Europeans. All the 22 Europeans had coronary atheroma; even a youth of 15 years had some mild lesions. Eight Europeans had severe lesions, 6 of them dying of coronary disease. Six had moderate lesions, and the remaining 8 had mild lesions. Thus, only 16.6% of the Africans had coronary atheroma compared with 100% of the Europeans. The author concludes that the copperbelt of Northern Rhodesia, where a highly susceptible race lives alongside another which is still practically immune, should be a promising place to investigate the causes of coronary atheroma.

Alpha and Beta Lipoproteins and Serum Cholesterol Levels Following Administration of Unsaturated Fatty Acids. T. D. Labecki, I. B. Bright, W. W. Lake and C. Thompson. Proc. Soc. Experi. Biol. & Med. 97:260-263 (Feb.) 1958 [Utica, N. Y.].

Twenty-five patients, 16 males and 9 females, ranging in age from 36 to 78 years, who had clinical evidence of myocardial infarction and who had been under continuous observation for 4 to 5 years, were the subject of this study. Controls were 20 subjects, ranging in age from 10 to 44 years, and 1 child of 3 years, with no demonstrable cardiovascular disease. The experimental subjects as well as the controls were encouraged to remain on a normal diet with no restriction of fat or cholesterol-containing food. Determinations were done monthly on fasting serum from the controls and experimental subjects and on pooled serum from healthy blood donors. Each blood sample was analyzed by a modified electrophoretic method for lipoprotein and protein fractions and by chemical analysis for cholesterol. The experimental subjects had been previously studied while receiving an unrestricted diet and a lipotropic mixture. The same diet and lipotropic mixture were continued, but to them there was added 3 Gm. of safflower seed oil and 4 mg. of pyridoxine per day. Maximum effects on fat metabolism had been achieved by the earlier regimen, and significant changes were considered to be due to the added safflower seed oil.

The place of publication of the periodicals appears in brackets preceding each abstract.

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Major aberration in lipid metabolism, as evidenced by greatly elevated total serum cholesterol level, elevated fasting chylomicron index, or even frank lipemia, had been demonstrated by others as predominant factors in premature and severe coronary atheromatosis. In the borderline cases, which comprise the majority of the clinical material studied here, one can apply only group correlation. The present study confirmed the group correlation between clinically demonstrable coronary atherosclerosis and abnormally low alpha to beta lipoprotein ratio. Daily administration of 3 Gm. of safflower seed oil and 4 mg. of pyridoxine for a period of up to 30 weeks, in addition to the previously administered lipotropes, resulted in a statistically significant increase of alpha to beta lipoprotein ratio starting at the 18th week. The trend continued for the 24-and-30-week periods in 18 of 24 patients. Twenty per cent of the patients showed lowered total serum cholesterol levels. The authors feel encouraged to proceed with the study over a longer period of time and with larger doses of safflower seed oil. The studies indicate that essential fatty acids do exert an unequivocal effect on serum lipids; in larger quantities they apparently lower total serum cholesterol level. In moderate doses, which are practical from the standpoint of the patient, there is a consistent and permanent shift from beta to alpha lipoprotein.

Nodular Goiter and Thyroid Cancer. R. Maass Escoto and S. Martinez. Rev. invest. clín. 9:211-219 (April-Sept.) 1957 (In Spanish) [Mexico, D. F.].

The incidence of carcinoma of the thyroid in nodular goiter is high. One hundred forty-two patients with nodular goiter were observed at the department of endocrinology of the Hospital de la Nutrición, of Mexico City, during a period of 10 years. One hundred thirty-two patients were women, and 10 were men. Fifteen patients (13 women and 2 men) had carcinoma of the thyroid. The goiter was uninodular in 13 patients and multinodular in 2. In 8 of the patients the thyroid was enlarged (showing diffusion of the carcinoma). The average duration of progressive enlargement of the thyroid carcinoma was 3½ years for tumors of an undifferentiated type and 8½ years for tumors of a differentiated type. It was observed that the physical characters of the nodules and the coexistence of hyperthyroidism are of no value for a differential diagnosis between benign thyroid nodules and thyroid cancer. The test of thyroidal function of the nodules, as shown by their capacity to concentrate iodide, still requires more experience for verification of its diagnostic value. Biopsy is the only procedure of value for the differential diagnosis between benign thyroid nodules and carcinoma of the thyroid. The authors conclude that the presence of nodules in the thyroid region calls for careful clinical examination and the taking of a specimen for biopsy, the results of which will permit early diagnosis and early surgical treatment of carcinoma of the thyroid before it progresses into an inoperable stage.

The Relapse Problem in Tuberculosis of the Lungs: A Study Based on Material from a Sanatorium over a Period of 10 Years. S. Bøyum. Acta tuberc. scandinav. 35:1-38 (No. 1) 1958 (In English) [Cope hagen].

Of 1,712 patients with destructive pulmona tuberculosis who were discharged from the Lys Sanatorium in Sogn, Norway, between Jan. 1, 19 and Jan. 1, 1956, 439 were patients with relaps This latter group consisted of patients who p viously had received either conservative or acti treatment at the Lyster Sanatorium or at anot hospital for active tuberculosis of the lungs (nc destructive or destructive), who were discharg from the sanatorium or the hospital symptom fr and who had had relapses for which they we re-treated at the Lyster sanatorium. Relapse defined as roentgenologic progression of the d ease, with or without cavity, or as the presence Mycobacterium tuberculosis alone without roe genologic progression. That a patient is sympt free on discharge means that there are no signs roentgenologic progression or cavity, the disea being stationary or receding, and that no signs Myco. tuberculosis have been found during t last 2 or 3 months before the patient's discharg Of the 439 patients with relapses, 163 (37.1%) we treated at the Lyster Sanatorium in the first half the 10-year period, and 276 (62.9%) were treated the second half of this period. The patients wi relapses thus constituted a steadily increasing p tion of the patients with destructive tuberculos Of the 439 patients with relapses, 278 (63.4%) we men, and 161 (36.6%) were women, and of the to of 1,712 patients discharged, 1,027 (60%) were me and 685 (40%) were women. These data sugge that there has been a somewhat greater tenden to relapse among men than among women. M predominated especially among the patients o 25 years of age.

It was not possible to decide whether heredi had any influence on the tendency to relapse. A though the largest group among the 439 patien with relapses were the 158 (36%) between the ag of 30 and 39 years, the conclusion cannot be draw that this age group has a pronounced tendency relapse. Since more men than women had relapse it must be taken into account that great physic and psychic strain is often connected with this ag particularly in men. No definite relationship b tween age and tendency to relapse was reveale by this study. Most cases of relapse occurred i patients who had returned to work after their di charge; most of them were manual workers, and more than 25% did heavy work. Most of the patients with relapses were in a worse position financially than healthy people who were fit to work in the same stratum of society. It is reasonable to believe that both economic conditions and physical strain exerted an influence on the tendency to relapse.

Of the 439 patients with relapses, 127 (28.9%) received conservative treatment; 221 (50.4%) were treated by pneumothorax, 59 (13.4%) by thoracoplasty, 4 (0.9%) by resection, and 28 (6.4%) by other methods. These data suggest that there is less tendency to relapse with permanent collapse than with temporary collapse and conservative therapy. Of the 439 patients, 365 (83.1%) had roentgenologic progression of their disease, including a few with specific bronchial processes, and in 74 (16.9%) Myco. tuberculosis had reappeared in the absence of roentgenologic progression. In patients with relapse after conservative treatment, progression occurred on the same side in more than 50%. The result of pneumothorax treatment depends greatly on whether the lung is free or adherent. After partly free pneumothorax (i. e., in the presence of remaining inoperable adhesions so that the lung has adhered again after having been free for some time), there were 5 times as many relapses on the same side as on the other side. Before the treatment was completed, however, there were far more cases with progression on the other side than on the same side. The treatment seemed, therefore, to be effective only as long as it lasted. In patients with thoracoplasty there were decidedly more cases of progression on the side that was not operated on. The number of patients subjected to resection was too small to permit conclusions, but most of the relapses occurred on the side operated on. All relapses after resection occurred within 1 year after the operation, and 83.1% of all relapses after thorocoplasty occurred within the first 5 years after the operation. It has not been possible to draw definite conclusions as to the effect of chemotherapy, since combined chemotherapy has been used extensively only in recent years, and the time of follow-up has been too short. It is certain, however, that among the discharged patients more have become symptom free than was the case before the institution of this method of treatment.

Chloroquine Treatment of 16 Patients with Active Rheumatoid Arthritis. P. Erlendsson. Bibl. læger 150:3-79 (No. 1) 1958 (In Danish) [Copenhagen].

Sixteen patients (3 men and 13 women) with clinically diagnosed active rheumatoid arthritis were treated from 15 days to 15 months with chloroquine diphosphate in doses ranging from 450 to 150 mg. daily. The patients' average age was about 55 years; the average duration of the disease was about 14 years. The disease was mildly active in 2 cases, moderately active in 3, and highly active in 11. After an average of 25 days' treatment, clinical improvement was noted in 10 out of 15 patients (1 patient was excluded from the evaluation because of too short observation time). Treatment was discontinued in the 5 unimproved patients, all with side-effects of various kinds. On the second evaluation, after an average of 75 days' treatment, improvement was found to be maintained in 9 patients; 1 patient had been eliminated due to an accident. In 6 improved patients the treatment was discontinued later on account of side-effects, and 15 months after the start all treatment was terminated for several reasons, with subsequent regression in all but 1 patient. Detailed report of the cases is included.

Influenza A (Asian) 1957: Clinical and Epidemiological Features in a General Practice. J. Fry. Brit. M. J. 1:259-261 (Feb. 1) 1958 [London].

This paper reports the effects of the recent influenza A epidemic on a south London suburban practice during the period from September to November, 1957. "Flu" tends to be rather a lax and facile label given to many short-term infections of the respiratory tract of indefinite etiology. It is almost certainly an inaccuracy when applied during interepidemic periods but is probably accurate when an epidemic is raging, especially when typical cases randomly selected are proved serologically to show evidence of recent infection with the virus of influenza A. (This was so in this epidemic.) Even so, it is probable that there was some inflation of numbers by including some patients with seasonal respiratory infections, but this was more than compensated for by the omission of those with influenza who did not seek medical attention. The 930 patients with influenza A seen during the epidemic represented an incidence of 17% in the practice, but it is estimated that at least 25% of the population at risk were affected. Highest rates of 30 and 36%, respectively, were recorded in children, aged 5 to 10 years, and in teen-agers. The clinical features were those common to all influenza epidemics—a sudden onset, marked prostration and fever, respiratory tract symptoms, and a slow and prolonged convalescence. There was a low rate of complications—only 4%; acute chest infections accounted for 3% and middle-ear infections for 1%. All these infections were mild and cleared up under treatment with antibiotics. No patient required admission to hospital, and no patient died from the effects of influenza. The epidemic produced a fivefold rise in the volume of work in the practice.

Comparisons with previous epidemics showed marked differences in age distribution and rates of complications. It is probable that each influenza epidemic has a pattern and character of its own, with a varying extent of spread, age distribution, virulence, and complication rate. With the present epidemic it has been considered unlikely that "second waves" will occur. Vaccines have a limited practical place in prevention. The present epidemic has been mild but extremely widespread. It is estimated that some 10 to 15 million persons were infected in this epidemic and that around 5,000 persons have died from the direct or indirect effects of influenza, giving a rate of 1 death for 2,000 to 3,000 cases of influenza.

The Clinical Patterns of Small-Bowel Tumors: A Study of 32 Cases. J. F. Patterson, A. D. Callow and A. Ettinger. Ann. Int. Med. 48:123-138 (Jan.) 1958 [Lancaster, Pa.].

Reviewing the records of patients with tumors of the small intestine, the authors found that the correct diagnosis was rarely made or suspected at the time of the initial examination. They have appraised the symptoms, signs, and laboratory findings of these patients to determine the indications for and the accuracy of roentgenologic studies, as well as the indications for diagnostic celiotomy. The 32 patients in this study were examined in the Pratt Diagnostic Clinic or the New England Center Hospital and proved to have, at operation or autopsy, a primary tumor of the small intestine which had caused symptoms or signs. Cases were excluded where the tumor was an incidental finding at operation or autopsy or where the primary site was the ampulla of Vater or organs other than the small intestine.

Most patients had a pattern of either obstruction, with attacks of crampy abdominal pain, or blood ss, characterized by intermittent severe bleeding in those with benign tumors and by anemia and occult blood in the stools in those with malignant tumors. Roentgenologic studies showed the tumor in 18 of the 29 cases studied with contrast mediums and led to the diagnosis in 2 other cases by disclosing evidence of obstruction. Three of the 9 tumors which were not seen by the roentgenologist were located mostly extraluminally and probably could not have been seen. Another 3 would have been visible if roentgenolgic studies of the small intestine had been requested. The final 3 were overlooked by the roentgenologist. Twenty-nine patients were treated surgically, and metastases (local or distant) were found in 15. Three patients who had adenocarcinoma of the jejunum survived for more than 5 years, while 7 of 8 patients who had sarcoma are either living or survived more than 5 years. It is apparent that early diagnosis of tumors of the small intestine requires a clinician alert to the clinical patterns and a roentgenologist aware of the roentgenologic abnormalities which may be produced by these tumors.

Toxoplasmosis: Review of Case of Acquired Pulmonary Toxoplasmosis. E. Espersen. Ugesk. læger 120:18-23 (Jan. 2) 1958 (In Danish) [Copenhagen].

The congenital form of toxoplasmosis is transmitted from the mother (in whom the disease can be established serologically but usually not clinically) through the placenta to the fetus. This condition in infants and children is characterized by encephalomyelitis, the most important symptoms of which are internal hydrocephalus, cerebral calcifications, chorioretinitis, general convulsions, or local or psychic defects. The main symptoms of acquired toxoplasmosis are fever, interstitial pneumonia, exanthem, inflammation of lymph nodes, encephalitis, and chorioretinitis. Clinical diagnosis of toxoplasmosis is established either by direct demonstration of Toxoplasma organisms or serologically. Diagnosis can be made by the intracutaneous test with toxoplasmin, an extract of Toxoplasma. The manner of infection is uncertain. While congenital toxoplasmosis and clinically manifest acquired toxoplasmosis are rare diseases, the subclinical form of acquired toxoplasmosis seems to occur often. Congenital toxoplasmosis often causes death, and grave cerebral defects can be found in the survivors. Except for some acute severe forms, the prognosis in acquired toxoplasmosis is good, especially in the nodular form. No specific therapeutic agent against the disease is known. In the case of one of the author's patients, a man aged 33 years, infiltration of both lungs was established in 1951. Aggravation of the pulmonary symptoms followed, with roentgenologic progression. On admission in 1956, the patient's general condition was affected, and there were infiltrative processes and cystic cavities in the upper two-thirds of both lungs. After exclusion of other pulmonary diseases with similar symptoms, biopsy of a nodular specimen suggested toxoplasmosis. The diagnosis was confirmed by a strongly positive seroreaction. Several series of treatment with sulfadiazine and mepacrine resulted in clinical improvement, with fall in the serologic titer. In pulmonary diseases of uncertain etiology, seroreaction for toxoplasmosis is advised.

Steroid Withdrawal Syndrome. O. Arlotti. Minerva med. 48:4143-4148 (Dec. 8) 1957 (In Italian) [Turin, Italy].

The author describes functional disorders caused by withdrawal of steroids in 2 patients. One patient, 50 years old, with lipid nephrosis, was given a course of prednisone in daily doses of 30 mg. administered for 10 days. The therapy was discontinued because of increased edema, increased arterial blood pressure, and azotemia. Twenty days later a second course of prednisone was reinstituted for a period of 30 days. As a result, diuresis increased, edema partly subsided, and urinary protein level decreased. The day after withdrawal of prednisone the patient complained of general weakness, headache, anorexia, pain in muscles, increased body temperature, and an intense diuresis. The symptoms subsided at the onset of the third course of prednisone and corticotropin (ACTH) administered for 1 month. At the end of this course the withdrawal symptoms were less intense, and polyuria disappeared. At the termination of the 4th course with prednisone and corticotropin, the same symptoms reappeared. They were still less intense than before and subsided within a month.

Another patient, 47 years old, with purpura, has received 4 courses of prednisone and long-acting corticotropin. After withdrawal, at the end of the first 30 days of therapy, a few mild symptoms (weakness and headache) appeared; they subsided within 20 days. After termination of the second course of prednisone and corticotropin the withdrawal symptoms were more pronounced, consisting of fever, nausea, vomiting, weakness, and melancholia. These symptoms disappeared during the third course of the prednisone-corticotropin therapy. The day after termination of this course the withdrawal symptoms reappeared; they were even more pronounced than before and included a marked polyuria (5 liters of urine during 24 hours). The symptoms subsided partly with the administration of corticotropin and potassium chloride.

The author believes that this withdrawal syndrome is a manifestation of the adrenal insufficiency caused by the steroid therapy and of other aspects of the exogenous hyperhormonism, such as reduced secretion of the antidiuretic hormone and excessive elimination of potassium. This syndrome can be prevented from the onset of the steroid therapy by combining cortisone or prednisone with small doses of prolonged-action corticotropin and potassium. Treatment of this syndrome consists in reinstituting steroid therapy in small doses, in rehydration measures, and in correction of electrolytic imbalances.

SURGERY

The Treatment of Electrical Burns. I. F. K. Muir. Brit. J. Plast. Surg. 10:292-299 (Jan.) 1958 [Edinburgh].

Of 33 patients who were treated at a center for plastic surgery, 27 had 36 electric burns caused by domestic electricity supply, which is usually 220 to 250 volts A.C., while 6 patients had injuries caused by high-tension currents of from 11,000 to 66,000 volts A.C. These injuries were actual contact burns. Injuries caused by flashing or arcing were not included. Burns sustained on the hot elements of electric heaters or stoves also were excluded, for these are usually pure heat burns, showing none of the features of true electric burns. The majority of burns involved the hand, but the general arguments presented apply to electric burns in other parts of the body. Shortly after the injury the electrically burned skin is white and is surrounded by a red margin. In the absence of surgical interference there is no extension of the area of skin necrosis, but progressive necrosis does sometimes occur in electric burns treated by surgical excision and the application of a free graft. The graft takes well in some cases, but in other cases tissue previously thought to be viable sloughs, and tendons, joints, or bones become exposed. This course has followed 10 of 20 burns treated by excision and free grafting. It has been stated that this sequence occurs because operation has been performed too early and that, if operation is delayed, the necrosis will have progressed to its limit, the viable tissue can be differentiated from the nonviable, and a free graft can be applied. More detailed examination of the records, however, does not support this assumption.

Attention is called to the difference in response of electric burns treated by excision and grafting and those treated by excision and the application of a pedicled flap. During the period under review there was no special bias in favor of flaps as opposed to free grafts. A free graft was always used when the bed appeared viable and suitable. Flaps, on the other hand, were used when important structures, such as tendons or joints, were exposed by the dissection or were left covered only by a layer of tissue of dubious vitality which looked unsuitable as a bed for a graft. The "flap" group represented, on the whole, burns that were worse than the "free-graft" group. The author believes that the following description will explain the superiority of the results obtained in burns treated by excision and repair by flap over those treated by excision and free grafting. Local progressive necrosis is not the direct and inevitable result of the electric injury but is due to bacterial infection of tissue which is viable but whose powers of resistance to infection have been depressed by the action of the electric current, and this tissue becomes exposed to infection by its own inability to support a graft. A pedicled flap, however, bearing its own blood supply, can close the wound and protect this abnormal tissue from bacterial infection.

The lesion described so far is a local necrosis in continuity of tissue directly influenced by the electric current, but there occurs another type of necrosis, an ischemic gangrene, due to thrombosis of the main digital vessels, which results in death of tissue not itself injured by the current. These 2 types of necrosis should be differentiated. In domestic supply burns, infection may cause local necrosis, but main vessel thrombosis is uncommon. In high-tension injuries, however, the current passes readily and for great distances along the main vessels, and necrosis due to vascular thrombosis is common and may dominate the clinical picture. In the 6 patients with high-tension burns, 14 limbs were affected, and in 7 of these vascular thrombosis developed, which resulted in the loss of limbs in 3, loss of digits in 3, and loss of the skin only of digits in the remaining 1. In injuries of the limb with main vessel thrombosis, the surgeon has no choice but to wait until a line of demarcation has been established, and the subsequent surgical treatment will be determined by the extent of the vascular gangrene and the position and size of the electric burn. As in the less severe injuries, closure of the wound is necessary to prevent infection and further necrosis, and radical excision followed by immediate closure of the wound offers a good prospect of success.

Common Iliac Artery Aneurysm in a Boy Six Years of Age. W. E. Fenn and J. E. Musgrove. Ann. Surg. 147:109-111 (Jan.) 1958 [Philadelphia].

Routine physical examination of a 6-year-old boy revealed, just below and to the left of the umbilicus, a round, nontender, expansile mass, the size of a golf ball. There was a definite systolic thrill over the mass, and on auscultation a loud systolic bruit could be heard with transmission into Scarpa's triangle. Roentgenograms of the abdomen showed a ground-glass density outlined by a fine rim of calcium in the region of the abdominal mass. An aortogram was performed by injecting 20 cc. of 70% Urokon into the aorta. This gave an excellent picture of the actual size and location of the aneurysm. Prior to the operation, a segment of superficial femoral artery was obtained from the vessel bank in preparation for excision of the aneurysm and graft replacement. The abdomen was entered through a long, left-sided, rectus muscle retracting incision. There was an aneurysm the size of a large hen's egg lying on the anterolateral aspect of the common iliac artery on the left. The peritoneum along the colic gutter on the left was divided and the sigmoid colon rolled medially to expose the external iliac and internal iliac vessels as well as the distal portion of the abdominal aorta. Penrose drains were placed about the common iliac artery on the right, the common iliac artery above the aneurysm on the left, and the internal and external iliac arteries on the left. The aneurysm had its point of origin on the common iliac artery approximately 2 cm. below the bifurcation of the aorta. The aneurysm was dissected from the surrounding areolar tissue by sharp and blunt dissection.

The wall of the aneurysm contained plaques of calcium. After aspirating the blood from the aneurysm and inspecting the orifices of the common iliac and the external and internal iliac arteries, there was quite a good channel in the posterior wall of the aneurysm, and it was thought feasible to excise the greater portion of the aneurysm and use the aneurysmal wall to repair the arterial defect. The distance between the orifice of the common iliac artery above and the internal and external iliac vessels below was approximately 2.5 cm. This distance was too great to bridge if the aneurysm was excised unless a graft was used. It was deemed wiser to leave the patient's normal tissues to carry on the continuity of the vascular tree. Therefore, the greater portion of the wall of the aneurysmal sac was excised, and by careful suturing of the proximal and distal portion of the aneurysmal sac, there was obtained what appeared to be a satisfactory orifice, both above and below, and the intervening portion of the sac was closed with a running mattress suture. When the distal clamps were removed from the iliac vessels, there was little bleeding from the suture line. The proximal clamp was then gently removed, and only 1 small suture had to be inserted along the suture line. With the clamps removed, the reconstructed vessel pulsated adequately. The patient had a satisfactory postoperative convalescence.

A Critical Evaluation of Anticoagulant Therapy in Peripheral Venous Thrombosis and Pulmonary Embolism. W. W. Coon, J. W. Mackenzie and P. E. Hodgson. Surg. Gynec. & Obst. 106:129-136 (Feb) 1958 [Chicago].

Since 1946 all anticoagulant therapy at the University of Michigan Hospital has been under the supervision of a team composed of representatives from the departments of medicine and surgery. A continuity in treatment policy has been maintained. All records of anticoagulant treatment from 1946 through 1955 on patients with acute deep venous thrombosis or pulmonary embolism were analyzed. The records of 511 patients were separated into 2 main groups on the basis of whether, at the time of initiation of treatment, the patient had leg vein thrombosis alone or had had a pulmonary embolus; it was expected that the latter group would have a higher complication rate and thus deserve special consideration. Both major groups were then subdivided into those treated without complication and those in whom a thromboembolic complication developed during or after the administration of anticoagulants. Heparin was the only agent given to 10 patients. Sixty-five per cent of the remaining 501 patients received heparin until a therapeutic effect had been achieved with the orally administered prothrombinopenic drugs. There was no significant difference in complication rate between the 175 patients who did not receive initial heparin treatment and the 326 patients who did. Of the 501 patients, 205 received bishydroxycoumarin (Dicumarol) and 265 phenylindandione (Indon). The others received a variety of prothrombinopenic agents of the coumarin and indandione series.

What has anticoagulant therapy accomplished in the prevention of deaths from pulmonary embolism? This question cannot be answered with statistical accuracy because of the difficulties in the clinical diagnosis of pulmonary embolism and because the accuracy of postmortem diagnosis varies with the care with which autopsy is performed. The authors estimate that only 1 patient in 8 with fatal or potentially fatal pulmonary emboli received anticoagulant therapy. Secondly, anticoagulant therapy (or any other known form of treatment) did not prevent all deaths from pulmonary embolism. The "potentially fatal" pulmonary emboli, those emboli that would have resulted in fatality had anticoagulants not been used, have been calculated from the percentage of fatal emboli occurring in Cosgriff's compilation of American cases of venous thrombosis and embolism in which conservative treatment only was received. The number of fatal pulmonary emboli at the authors' hospital were obtained from a review of the autopsy reports for a similar 10-year period, 1945 to 1954, during which time a mean autopsy rate of 68.6% was obtained. Although the results of any therapy in the prevention of death from pulmonary embolism are dismal, the authors believe that anticoagulants prevented death in 7 of every 10 patients whose venous thrombosis or nonfatal pulmonary embolus was recognized and treated when compared with the expected mortality attending the use of conservative measures alone. Anticoagulants are of additional value in reducing morbidity during the early course of the disease. Their influence on postphlebitic sequelae is being assessed in a long-term follow-up on the patients comprising this report. In patients in whom a clinical diagnosis of venous thrombosis or pulmonary embolism can be established, anticoagulant therapy can effect a significant reduction in morbidity and mortality.

The Use of L-Triiodothyronine as a Pituitary Depressant in the Management of Thyroid Cancer. C. G. Thomas Jr. Surg. Gynec. & Obst. 106:137-144 (Feb.) 1958 [Chicago].

In the experience of the author the suppression of pituitary thyrotropic hormone has been a logical approach to the control of inoperable thyroid cancer. This has usually been accomplished through the administration of desiccated thyroid, thyroxin, and more recently, L-triiodothyronine. In order to study the efficacy of L-triiodothyronine as a pituitary depressant and its effect on human thyroid cancer, patients with thyroid cancer were appraised for type, extent, and functional activity of their neoplasm; their metabolic status was determined by clinical evaluation in conjunction with determination of serum protein-bound iodine and uptake of radioiodine (I^{131}). L-triiodothyronine was then administered by mouth in divided doses, beginning at 25 mcg. twice daily, with increasing increments at 1-to-2-week intervals until tolerance or a level of 200 to 300 mcg. daily. This dosage was continued for periods extending from 6 weeks to 1 year or more. Periodic determinations of the serum protein-bound iodine reflecting the endogenous output of thyroid hormone were procured during the course of the study. These findings were correlated with gross changes in the primary or metastatic neoplasm and, when possible, with uptake of radioiodine.

In patients with an operable lesion, thyroidectomy was performed after an appropriate interval and both normal thyroid and neoplasm appraised for morphologic changes. Metabolic activity of the normal, nodular, and cancerous thyroid was also appraised by determining the incorporation of radiophosphorus (P^{32}) administered intravenously 24 hours before surgery as sodium hypophosphate. At the time of operation, biopsy specimens of tumor, normal thyroid, and adjacent sternocleidomastoid muscle were weighed to 0.10 mg., baked at 125 C for 24 hours, and their radioactivity per unit weight determined. Thyrotropic hormone suppression was evaluated indirectly by appraisal of serum protein-bound iodine levels, I^{131} uptake, incorporation of P^{32} into the thyroid, and morphologic changes in the thyroid.

Ten patients with thyroid cancer in various stages of disease, i. e., localized to thyroid or with lymph node, pulmonary, and bony metastases, were suitable for study. The response of these patients to L-triiodothyronine is recorded. The author concludes that the administration of L-triiodothyronine is a simple and effective means of depressing the output of thyrotropic hormone by the anterior pituitary as measured by the loss of function and atrophy of the normal thyroid gland. It is superior to other thyroid hormones in this regard, because its biochemical characteristics permit a quantitative measurement of endogenous thyroid hormone output and, by inference, thyroid inhibition. In the treatment of patients with thyroid cancer by the administration of exogenous thyroid hormone, the use of L-triiodothyronine permits a more accurate and quantitative measurement of pituitary gland suppression. The response of thyroid cancer seems similar to that observed when other means of pituitary inhibition are employed.

Surgery of Major Arterial Aneurysms. T. O. Murphy. Northwest Med. 57:183-188 (Feb.) 1958 [Seattle].

The author reports on 108 patients, between the ages of 16 and 84 years, with 114 arterial aneurysms for which they were operated on between December, 1954, and January, 1958. Six patients had multiple aneurysms. Ninety aneurysms were of the abdominal aorta, of which 44 required resection at the bifurcation. Thirteen were of the thoracic aorta, and 11 were of the peripheral vessels. Ninety-six of the patients with arterial aneurysms were operated on electively. In 18 patients the aneurysm had ruptured, necessitating emergency intervention. There were 14 deaths and only 4 successful repairs in these 18 patients. In the 96 patients subjected to elective operation for aneurysm, there were only 10 deaths, and 8 of these were in patients with a thoracic aneurysm. In 6 patients there was failure of the arterial prosthesis, due to either immediate or late rupture of the graft or to secondary thrombosis. Five of these patients were again operated on, with 4 of the secondary attempts being successful in reestablishment of arterial continuity.

In repair of the 114 arterial aneurysms, 49 compressed polyvinyl sponge prostheses, 28 arterial homografts, 21 nylon prostheses, and 5 saphenous vein autografts were used. In 11 instances arterial continuity was reestablished without use of a graft. Choice of device to be used in arterial replacement depends much on the materials at hand as well as on familiarity of the surgeon with the various agents. Where the graft must withstand a high degree of flexion and foreshortening (axillary, cervical, and popliteal areas), the saphenous vein autograft is felt to be the only one suitable. The procedure was successful in 78% of the 114 aneurysms operated on and in 87% of the 96 patients subjected to an elective procedure. Recovery of the patient after major arterial surgery was dramatic, even in the highest age groups, with the average hospital stay being only 10 days. It is felt that, if blood loss is kept at a minimum and the anesthesia is well controlled, the procedure may be undertaken electively with a minimum of risk.

Treatment of Cervical Syndrome by Means of Traction of the Cervical Spine. A. Wildervanck. Nederl. tijdschr. geneesk. 102:5-8 (Jan. 4) 1958 (In Dutch) [Amsterdam].

The view that the cervical syndrome is due to mechanical irritation of the cervical nerve roots has been more widely accepted in recent years. The author reviews observations on 143 patients who were treated by traction of the vertebral column after other treatments had failed. These patients had had the cervical syndrome from 3 months to several years. Those in whom the existence of hypertension, heart disease, or other serious internal disorders had been verified by a thorough physical examination were excluded from the traction therapy. Treatment consisted in applying traction to the head with the aid of Glisson's sling and with a 15-kg. weight once every day for 15 minutes in the vertical direction and with the patient sitting down. The patient was urged to be as relaxed as possible. While some of the patients (14%) were free from complaints after 4 treatments, the average number of treatments given was 9. Eighty (56%) of the patients were completely freed from their complaints, and 22 (15%) were greatly improved. There was little or no response in the remaining 41 patients (29%). Recurrence within 1 or 2 years was rare.

Morphologic Findings in Fatal Postoperative Thyr toxic Crisis and the Problem of Status Thymic lymphaticus. K. Keminger and J. Piribauer. Arc klin. Chir. 286:351-367 (No. 4) 1957 (In Germa [Berlin].

Morphologic studies were made on 6 patien with toxic diffuse goiter, who died as the result a postoperative thyrotoxic crisis. All had a seve form of toxic goiter, a colloid struma, and had bee completely or partially resistant to preoperati iodine therapy. They were thin and hypoplast and had a narrow aorta, a large thymus, and a mor or less severe hyperplasia of the lymphatic apparatus. On the basis of clinical observations an morphologic findings, the authors believe that th following hypothesis may explain the nature of th thyrotoxic crisis that develops after thyroidectom It is a severe disturbance of the neurohormona equilibrium, which is extremely unstable in patients with diffuse toxic goiter. The adrenal corte which is overloaded as the result of the high rat of metabolism involved in hyperthyroidism, becomes exhausted, and the stress (Selye) produce by the trauma of the operation leads to complet failure. Furthermore, as the result of the sudde thyroxin deficiency resulting from the resection o the goiter, hyperthyroxinemia is rapidly replace by hypothyroxinemia, and this loss of thyroxin ha an extremely unfavorable effect on the organism that had become accustomed to an excess of thyroxin. However, the fatal outcome is probably th result of the sudden flooding of the organism wit epinephrine. The epinephrine effect probably take the following course: 1. The stimulus exerted o the hypophysis results in increased output of corticotropin (ACTH). 2. The exhausted adrenal corte collapses as the result of the increased stimulatio by corticotropin. 3. Intoxication of the organism that is hypersensitive to epinephrine as the resul of hyperthyroidism results in heart failure from auricular fibrillation.

The thymus and the lymphatic tissues are probably the site of a counter-regulatory measure of th organism in the presence of severe toxic goiter brought on by the increased secretion of thyrotropic hormone, on the one hand, and by adrena cortical insufficiency, on the other hand. It is probable that the organism will attempt, although in a inadequate degree, to neutralize the thyrotropic hormone of the hypophysis. This might explain why so far it has been impossible to demonstrate an increase of thyrotropic hormone in the blood.

Only in extremely advanced cases of diffuse toxic goiter, which might be designated as "decompensated," there might occur renewed activation of the involuted thymus. The authors accept this explanation on the basis of their own observations on 3 cases. In 1 patient there developed in the course of so-called sexogenic dwarfism, which in all previously reported cases was accompanied by early involution of the thymus after the development of diffuse toxic goiter, a hyperplasia of the thymus (a so-called persistent thymus). In 2 other patients a so-called persistent thymus caused death only after operation for diffuse toxic goiter, but not in an earlier operation for acute appendicitis. The authors believe that for this reason it might be more correct to speak of hyperplasia of the thymus rather than of persistent thymus. It appears that hyperplasia of the thymus and hyperplasia of the lymphatic apparatus are the characteristics of a constitutional type, possibly geographically limited, and it appears probable that the extremely severe and usually fatal toxic diffuse goiter develops only in this constitutional type.

Clinical Experience with 31 Consecutive Cases of Surgical Intervention for the Control of Bleeding from the Upper Gastrointestinal Tract. J. M. Parker. New England J. Med. 258:417-421 (Feb. 27) 1958 [Boston].

Between 1942 and 1957, the author performed 31 gastric resections for the control of major, persistent, or recurrent hemorrhages in 26 men and 5 women between the ages of 39 and 88 years; 26 patients were over 50 years of age. Eighteen patients had a duodenal ulcer, 6 had a gastric ulcer, and 2 had a jejunal ulcer; 5 patients had gastritis. There were 2 deaths. One patient operated on for a large posterior-wall duodenal ulcer with focal pancreatitis developing about the penetrating crater, complicated by septicemia due to infection with Clostridium welchii, died on the 24th postoperative day. Another patient operated on for a jejunal ulcer died of septicemia due to infection with Proteus vulgaris on the 6th postoperative day. The first 2 patients with gastritis, who had been subjected to resection of 75% of the stomach, required reoperation and devascularization of the gastric remnant for recurrent massive hemorrhage. Evisceration secondary to cardiac decompensation and pulmonary edema occurred in 1 of the last 3 patients with gastritis treated by resection of 80% of the stomach and devascularization; the condition required resuture, and the patient recovered. Neither death nor complications occurred in the 6 patients operated on for gastric ulcer.

Combined medical and surgical management is considered of major importance. Diagnosis of the cause of the hemorrhage rested primarily on history, on physical examination, on specific negative laboratory tests to rule out blood dyscrasias, bleeding varices, and uremia, and on x-ray examination of the upper gastrointestinal tract unless the patient's condition prohibited this procedure. The definitive indications for emergency resection, which was carried out in all but 7 patients by the end of the first 48 hours after the onset of bleeding or the time of arrival at the hospital, were the volume and persistence of hemorrhage requiring intensive and continuous blood replacement. The average amount of whole blood required by the patients with duodenal ulcer was 3,900 cc., that required by the patients with gastric ulcer was 4,500 cc., and that required by those with jejunal ulcer was 3,750 cc. The average blood replacement for the first 2 patients with gastritis was 15,750 cc., and that for the last 3 patients was 4,830 cc.

The Results of Total Gastric Resection in Cancer of the Stomach. K. Nakayama. Chirurg 29:1-3 (Jan.) 1958 (In German) [Berlin].

Total gastrectomy was performed on 404 patients on account of carcinoma of the stomach and on 18 patients with ulcers of the stomach suspected of being carcinomatous. The surgical death rate was 3.3%, which was considerably less than that in other reports on total gastric resection. The author believes that this is due chiefly to the use of supporting sutures. When a direct esophagoduodenal anastomosis was carried out, supporting sutures were applied between the capsule of the pancreas and the crus of the diaphragm before the anastomosis was completed. In case of an esophagojejunostomy, supporting sutures were applied between the posterior wall of the jejunum and the crura of the diaphragm. Furthermore, when the anastomosis was carried out by an intrathoracic approach, the supporting sutures were placed between the mediastinal pleura and the loop of the small intestine utilized in the anastomosis. Previous to the use of these supporting sutures the death rate from total gastric resection at the author's clinic had been 14.8%.

The following techniques of total gastric resection were used: (1) direct esophagoduodenostomy; (2) intercalation of a loop of the jejunum between the esophagus and the duodenal stump; (3) esophagojejunostomy with an end-to-side anastomosis according to Braun. The author's predecessor, Professor Seo, introduced a method of intercalation and designated it a "physiological" total gastric resection, because the transplanted loop takes over the function of the stomach and the food always passes through the duodenum. The author himself found that the transplantation of a loop of the jejunum between the esophagus and the duodenal stump is the best method for total gastric resection. A particular advantage of this method is that postoperative anemia is less likely in the first 3 years after the operation than it is with methods of resection that dispense with the intercalation. To be sure, patients that survive longer than 3 years generally have a hyperchromic anemia regardless of what surgical method has been used. It appears that the results of the intra-abdominal anastomosis are superior to the abdominothoracic one, but this is explained chiefly by the fact that the intrathoracic method is used only in the advanced cases of cancer. A general comparison of the results of the 3 aforementioned methods revealed little difference, because the result seems to depend chiefly on the degree of malignancy and the degree of infiltration of the gastric carcinoma rather than on the technique of the operation.

The postoperative survival was better when resection of the tail of the pancreas and splenectomy were added than it was with simple total gastrectomy. The regional lymph nodes were removed in the more extensive operation. Although the surgical mortality was comparatively low when involved neighboring organs were removed together with the stomach, the late results were poor; and this can be said of total gastric resection in general. Partial gastric resection in which a portion of the stomach is left intact protects the patient against serious malnutrition and anemia. In patients in whom the carcinoma is located high up or near the cardia, the author removes only this portion of the stomach. He hopes that earlier diagnosis of gastric carcinoma will reduce the need of total resection of the stomach.

Comparison of Complications Following Intestinal Surgery After Oral and Parenteral Preoperative Antibiotic Preparation. D. F. Phillips, W. H. Dearing and J. M. Waugh. Surg. Gynec. & Obst. **106**: 145-152 (Feb.) 1958 [Chicago].

The incidence of postoperative complications in a consecutive unselected series of 261 patients who had various types of intestinal operations after parenteral administration of penicillin, streptomycin, and dihydrostreptomycin only is compared with that in a series of 243 patients who underwent various intestinal operations after oral administration of members of the tetracycline group of antibiotics. The incidence of postoperative complications differed little (5.3%) between the 2 groups, and there was no significant difference in the mortality rate. Preoperative preparation of the intestinal tract with orally administered tetracycline drugs produced no fewer complications in those patients whose intestinal surgery did not involve an intraperitoneal intestinal anastomosis than did simple parenteral administration of penicillin, streptomycin, and dihydrostreptomycin the evening before surgery was to be performed and subsequent to operation. However, preparation of the intestine with tetracycline drugs given by mouth, when intraperitoneal intestinal anastomosis was included in the operation, resulted in fewer complications than did preparation with parenterally administered penicillin, streptomycin, and dihydrostreptomycin.

Primary Cancer of the Liver: General Study. J. C. Jauregui. An. cir. 22:220-237 (July-Sept.) 1957 (In Spanish) [Rosario, Argentina].

Primary carcinoma of the liver is rare, whereas metastases to the liver from cancer in other structures is frequent. The main causal factors in primary carcinoma of the liver are an hereditary predisposition or cirrhosis of the liver. Nutritional deficiencies, local infection, inflammation, and parasitosis may act as aggravating factors. The disease may be of a nodular, massive, diffuse, or cirrhotic clinical form and of the hepatocellular, cholangiocellular, or cholangiohepatic histological varieties. Abdominal pain, gastrointestinal disorders, and jaundice are the most frequent, although not characteristic, symptoms. There are great hepatomegaly, with hard nodular induration of the liver, hemorrhagic ascites, splenomegaly, edema of the legs, and moderate anemia. The tests for function of the liver show dysfunction only late in the course of the disease. Metastases are intrahepatic in 80% of the cases and to distant structures in 50% of the cases. The regional lymph nodes, the lungs, and the portal venous system are the structures most frequently involved by the metastases. The disease follows a rapid course with fever, jaundice, liver insufficiency, delirium, and stupor; this deepens into coma in the advanced stage. A clinical diagnosis is suggested by the presence of a rapidly growing tumor in the liver. Roentgenography, splenoportography, determination of cancer cells in the ascitic fluid, laparoscopy, puncture biopsy, and explorative laparotomy are of value both for the diagnosis of cancer and for a differential diagnosis between primary cancer and metastatic cancer of the liver. Biopsy of a specimen obtained by puncture, either with aspiration of material or with the Vin Sylverman needle, is a dangerous procedure. It may give false results, since the material obtained for biopsy may have been taken from a region not involved by carcinoma. Exploratory laparotomy permits taking of a biopsy specimen and predicting the possibilities of success of a surgical intervention for the patient as indicated by the character of the carcinomatous lesion (whether circumscribed or diffuse) and the degree of involvement of certain groups of lymph nodes.

Primary carcinoma of the liver is an acute disease. Most of the patients do not survive for more than 6 months after appearance of symptoms. Partial resection of the carcinomatous lesion or, better, lobectomy of the left or right lobe of the liver is indicated, provided that (1) the tumor is solitary and not diffuse, (2) the regional lymph nodes and the hili are not involved, and (3) the functions of the liver are reasonably normal. The progress of surgery and of anesthesiology and the use of antibiotics offer a period of survival to these patients which, according to the literature, amounts to more than 5 years postoperatively in more than half of the patients who have had the operation. Five cases are reported in which the diagnosis of primary carcinoma of the liver was made by either puncture biopsy or biopsy during exploratory laparotomy.

Surgical Experiences in the Treatment of Aneurysms of the Thoracic Aorta. F. H. Ellis Jr., J. W. Kirklin and A. J. Bruwer. Surg. Gynec. & Obst. 106:179-192 (Feb.) 1958 [Chicago].

The poor prognosis of untreated thoracic aneurysms justifies surgical intervention. The authors review the problem in the perspective of experiences gained in the management of 20 patients with thoracic aortic aneurysm. These patients underwent surgical exploration at the Mayo Clinic in the 3-year period from 1954 through 1956. There were 18 male patients and 2 female. Their ages ranged from 5 to 71 years. Almost two-thirds of the patients were in the 6th, 7th, and 8th decades of life. Arteriosclerotic aneurysms were the ones most commonly encountered. Others were syphilitic, traumatic, congenital, mycotic, and dissecting in nature. In the 20 patients 15 of the aneurysms were resected; 10 of the patients survived resection, the mortality rate being 33.3%. Grafts were employed in all but 1 patient, in whom lateral excision and aortorrhaphy were performed. Homologous aortic grafts were employed in 12 patients and polyvinyl formal (Ivalon) grafts in 2.

Hypothermia was used in most cases as a means of avoiding ischemia of the spinal cord during cross clamping of the aorta. Hypothermia is not without dangers. Ventricular fibrillation is a well-known complication, particularly in older patients with arteriosclerosis. Although the average body temperature achieved in the patients operated on by this method was less than 86 F (30 C), a safer level would be 89.5 F (32 C). This should allow up to an hour of aortic occlusion with minimal danger of spinal cord ischemia. Weakness of the legs developed in 1 patient who underwent aortic occlusion for 90 minutes. Another complicating feature of operations carried out under hypothermia is the temporary bleeding tendency. Replacement of blood often amounting to several liters is essential. Prompt and adequate rewarming is important and may be facilitated by irrigating the thoracic cavity with large quantities of warm saline solution prior to closure of the thorax. Since there is a time limit, blood flow should be reestablished as soon as possible. This can be expedited in many instances by opening the aneurysm, removing the clot and excess tissue, and suturing the graft in place before completely removing the sac.

Considerations in the Treatment of Amebic Abscess of the Liver in Pondichéry: Report of 45 Cases in Patients Operated on. M. Guillemeteau. Bordeaux chir. pp. 220-225 (Oct.) 1957 (In French) [Bordeaux, France].

The author reports on 45 patients operated on for amebic abscess of the liver at the French Colonial Hospital in Pondichéry, on the Bay of Bengal, in French India. On admission to the hospital, the patients had amebic dysentery, pain in the epigastric region, fever, hyperleukocytosis, and a swelling in the left paramesial region. Needle biopsy of specimens obtained from the livers of 44 patients confirmed the diagnosis. The right lobe of the liver was the site of the abscess in 36 patients and the left lobe in 9; 2 patients had recurrences of the abscess 18 and 13 years, respectively, after a previous operation. Pleural complications occurred in 4 patients, peritoneal complications occurred in 3, and a secondary postoperative hemorrhage occurred in 1. Four patients died, representing an operative mortality rate of 9%; 2 of the deaths occurred in patients with peritoneal complications, 1 in the patient with secondary hemorrhage, and 1 in a woman who recently had given birth to a child and who died of acute hepatic insufficiency. Forty-one patients recovered, and 6 of these required a repeated intervention. Of these 6, 2 had pleurotomies, 2 were reoperated on because of retention of pus after removal of the drain, 1 was reoperated on for chondritis of the rib cage, and 1 was reoperated on for a "hepatic chamber" which had to be decorticated by removing the sclerous shell with the curet. The 35 patients who recovered without repeated surgical intervention had prolonged suppurations, which made prolonged drainage necessary and were frequently associated with reinfection. All the patients were given postoperative treatment with antiamebic and antianemic agents; they were also given vitamins and a diet rich in proteins, but despite this method of management, hospitalization was of long duration and convalescence was slow.

These observations suggest that the classic rules for the surgical treatment of hepatic abscess are still valid. Preoperative and postoperative treatment with drugs is essential. An exploratory biopsy always should be made to confirm the clinical diagnosis of an abscess. As soon as the diagnosis is established, the evacuation of the abscess cavity should be performed without any further delay and should be followed by drainage. Provided that these rules are observed, the risk associated with the surgical intervention is not grave, and rapid recovery may result.

NEUROLOGY & PSYCHIATRY

Diagnosis of Cerebral Schistosomiasis. J. F. Hammarstein. A. M. A. Arch. Neurol. & Psychiat. 79: 132-135 (Feb.) 1958 [Chicago].

Cerebral schistosomiasis may produce a variety of neurological symptoms, such as headache, language dysfunction, paralysis, and Jacksonian or grand mal seizures. Therefore, a patient presenting such symptoms, who has resided in an endemic area even years before, should be studied for possible cerebral schistosomiasis. The search for ova in the feces is a difficult and time-consuming procedure. This report demonstrates the efficiency of biopsy of a rectal specimen in the diagnosis of schistosomiasis. The 12 patients on whom this report is based were hospitalized at 2 Veterans Administration hospitals. All had schistosomiasis japonica, and all had been in the Philippine Islands. From 3 to 10 years had elapsed between the time of exposure and the diagnosis. Only 2 patients had a definite history of acute schistosomiasis while in the endemic area. Four of the 12 patients had seizures, 2 had focal seizures alone, 1 had generalized grand mal and focal seizures, and 1 had psychomotor attacks. In 3 the diagnosis was first established by a craniotomy. A positive Wassermann reaction in the spinal fluid with a negative Wassermann reaction in the blood was present in 2 patients. Whereas eosinophilia was present in most of the 12 patients, hepatomegaly, splenomegaly and abnormal results of liver function tests were observed in only a few of them. In this connection the author points out that, whereas hepatic and splenic damages are frequent in long-term residents of endemic areas, this is not the case in short-term residents. Stool examinations were positive in only 2 of the 12 patients, despite numerous studies. In contrast, the biopsy of a rectal specimen was positive in all but 1 patient.

Epidemic Infection with Coxsackie Virus Group B, Type 5: I. Clinical and Epidemiologic Aspects. H. Rubin, P. H. Lehan. I. L. Doto and others. New England J. Med. 258:255-263 (Feb. 6) 1958 [Boston].

Aseptic meningitis has been shown to be due to varied conditions, including mumps, leptospiræ, poliomyelitic viruses, Coxsackie viruses, and most recently ECHO viruses. The cardinal manifestations of the syndrome are stiff neck, fever, headache, and pleocytosis of the spinal fluid, with a predominance of lymphocytes. Coxsackie viruses of group B, types 1 to 4, have been reported earlier as the etiological agents in epidemics of aseptic meningitis This report describes the clinical and epidemiologic features of an outbreak that the authors believe to be the first epidemic of aseptic meningitis attributed to Coxsackie virus group B, type 5. The epidemic occurred during the summer of 1956 in Cerro Gordo County, Iowa, which has a population of 46,000. The outbreak centered in Mason City, the county seat, with a population of approximately 33,000. The general sanitation of the community is good.

This study was carried out during the 2 weeks after the peak of the outbreak, at a time when the number of new cases occurring in the community was decreasing. A total of 63 hospitalized and 52 nonhospitalized patients were studied. The outstanding characteristic of this illness was the broad clinical spectrum, ranging from minor symptoms to the syndrome of aseptic meningitis requiring hospitalization. Children were most frequently affected, especially those 5 to 9 years of age. Two-thirds of all patients were under the age of 20. The virus recovery rate was high from stools and throat washings. The virus was also isolated from the cerebrospinal fluid in 2 cases. Multiple isolations of the virus were obtained within families in both patients who were clinically ill and their family contacts. The evidence indicates that, once the virus is introduced into the family, it infects everyone in the family. The most likely mode of virus transmission was thought to be a person-to-person contact, either by the fecal-oral route or by the respiratory route.

Outbreak of Aseptic Meningitis with Exanthem. J. F. Galpine, T. M. Clayton, J. Ardley and N. Baster. Brit. M. J. 1:319-321 (Feb. 8) 1958 [London].

The authors report on 29 male and 22 female patients, between the ages of 15 months and 36 years, with aseptic meningitis, associated in 19 with a rash, who were admitted to hospital in Coventry, England, during the last 4 months of the year 1956. Twenty-three cases of the disease in these patients were familial, being derived from 9 families. Study of consecutive illnesses in several families suggested an incubation period of 5 or 6 days. Twenty-seven of the 51 patients were children, between the ages of 5 and 14 years. The rash was erythematous in 17 patients, mixed erythematous and petechial in 1, and solely petechial in 1. The erythema consisted of small pink discrete macules or maculopapules resembling those of rubella. It always invaded the face, to which it was limited in 9 patients, often affecting the cheeks only. Specimens of feces from 27 patients were examined, and in those of 19 patients a virus related to ECHO virus, type 9, was isolated; this resembled the experience in a number of other outbreaks of aseptic meningitis, associated with a rash, which occurred in various parts of England and on the European continent. Eighteen of these 19 patients showed a significant rise of antibody titer to ECHO virus type 9, during their illness. If the rash can be taken as evidence of viremia, it may indicate that the central nervous system is infected by way of the blood stream. The illness was benign and only occasionally acute enough to cause temporary anxiety. Encephalitic signs were absent. Symptomatic treatment only was given except for 1 patient, with one of the more severe cases, who received chloramphenicol. Recovery was rapid and complete.

The Megalencephalic Phase of Infantile Amaurotic Familial Idiocy: Cephalometric and Pneumoencephalographic Studies: S. M. Aronson, A. Lewitan, A. M. Rabiner and others. A. M. A. Arch. Neurol. & Psychiat. 79:151-163 (Feb.) 1958 [Chicago].

While no specific therapeutic agents have been introduced to retard the inexorable progress of amaurotic familial idiocy (Tay-Sachs disease), adjunct measures, such as antibiotics, have led in recent years to a protracted clinical course of this uniformly fatal infantile disorder. Thus, whereas medical textbooks of a few decades past mentioned an average life span of somewhat less than 18 months, the 50 children in the presently reported series survived to an average age of 28 months. The present report presents a segment of a comprehensive study of 50 patients with infantile amaurotic familial idiocy and is specifically concerned with serial cephalometric and pneumoencephalographic observations on 15 of these children. The findings were compared with the autopsy data of 20 cases of this series. In many of the children, the duration of life was significantly prolonged, culminating in massive megalencephaly, a feature not sufficiently acknowledged in the past. This was evident in a markedly increased head circumference as well as an increase in brain mass, visualized roentgenographically and at autopsy. Morphologic studies helped to clarify the paradox of an enormous increase in brain weights in the presence of progressive neuronal degeneration. It was observed that the late megalencephaly was the result of a reactive glial overcompensation and hyperplasia.

GYNECOLOGY & OBSTETRICS

The Outlook for Future Pregnancies in Women Immunized to Rh. E. L. Potter. Am. J. Obst. & Gynec. 75:348-356 (Feb.) 1958 [St. Louis].

The outlook for a successful pregnancy in a woman immunized to Rh is never hopeless, and the outcome of a subsequent pregnancy can never be predicted with certainty. An analysis of the histories of 241 women delivered of 302 infants at the Chicago Lying-in Hospital after they became immunized shows that the outcome of any given pregnancy is related to the outcome of the pregnancy immediately preceding it. After the birth of a surviving erythroblastotic infant, the next child survived approximately 50% of the time. After the birth of a child who died, the next child survived 20% of the time. After a stillbirth, the survival was only 10%. With the current improvement in treatment, a somewhat larger percentage of infants should survive in the future.

Women who have had stillborn erythroblastotic infants have had more total pregnancies after immunization than those whose erythroblastotic infants were born alive; before immunization they had about the same number. Those who had a surviving erythroblastotic infant born at the Chicago Lying-in Hospital had an average of 1.9 pregnancies before immunization and 1.8 subsequently. Those with an infant who died had an average of 1.8 pregnancies before immunization and 2.3 after immunization. Those with a stillborn infant had 2.1 pregnancies before immunization and 2.6 subsequently. The first group averaged 2.7 total surviving infants, 1.0 not surviving; the second group averaged 1.6 surviving infants, 2.5 not surviving; the third group averaged 1.7 surviving infants, 3.0 not surviving. The variability in the outcome of pregnancy in which immunization is present must be taken into account in the attempt to evaluate any method of prevention or treatment of erythroblastosis.

Uterine Synechias: Clinical Observations on 20 Cases. P. Sirbu, A. Coman and E. Vexler. Gynéc. et obst. 56:521-528 (No. 5) 1957 (In French) [Paris].

The 20 patients with intrauterine adhesions, which the authors refer to as uterine synechias, were observed in the consulting service for sterility at a gynecologic and obstetric center in Bucharest from 1954 to 1956. Fifteen of these women complained of sterility and 5 of recurrent abortions. The patients with uterine synechias accounted for 3.75% of all the cases of sterility observed during the period in question. Fourteen of the 20 patients had synechias of variable extension in the corpus uteri, some being total and others partial, and they were located either in the center or laterally in the uterine cavity. Two patients had isolated cervicoisthmic synechias, and in 4 patients cervicoisthmic synechias were associated with synechias in the corpus uteri. These intrauterine adhesions seem to develop mostly from curettage used after abortion or delivery. This seems to indicate that, in addition to trauma and infection, the puerperal state of the uterus plays an important role in their etiology.

The uterine synechias are an important factor not only in sterility and habitual abortion but also in menstrual disturbances, such as hypomenorrhea, oligomenorrhea, and amenorrhea. The diagnosis can be made with the aid of the history, hysterometry, and hysterosalpingography. Roentgenologic examination is indispensable, instrumental examination alone being insufficient. The temperature curve and vaginal smears are important tests for the study of ovarian function in patients with uterine synechias. Biopsy of the endometrium reveals disturbances in the susceptibility of the uterine mucous membrane. In addition to pictures of uniform endometrial hypoplasia, these patients frequently show endometrial zones in the almost normal estrogenoprogesterogenic phase next to hypoplastic endometrial regions with insufficient development of the vascular system. With regard to the treatment of these intrauterine adhesions, the authors are of the opinion that only the total synechias which have existed for several years are benefited by immediate surgical intervention. In the presence of more recent and less extensive intrauterine adhesions, they try minor vaginal interventions before a major operation by the abdominal route. With this therapeutic approach, they have obtained lasting improvement in the menstrual function in 13 of 20 patients. Three of these patients subsequently were able to carry pregnancies to term and had normal infants.

Severe Exacerbation of Cancer of the Breast After Oöphorectomy and Adrenalectomy: Report of Four Cases. R. E. Wilson, A. G. Jessiman and F. D. Moore. New England J. Med. 258:312-317 (Feb. 13) 1958 [Boston].

Four women, aged 62, 45, 44, and 49 years, respectively, with cancer of the breast, underwent radical mastectomy. Only 1 of the 4 patients had passed through her menopause; the other 3 were premenopausal at the time of the operation. Axillary lymph nodes were free of tumor in 3 patients. Ten lymph nodes were involved in 1 patient who received postoperative x-ray therapy to the axillary, supraclavicular, and mediastinal areas. Extensive osteolytic lesions involving the pelvis, spine, and long bones occurred in all 4 patients within 9 months to 7 years after the surgical intervention, and bilateral ovariectomy was performed.

The 62-year-old patient was in a state of relatively stable balance between her tumor and its endocrinological environment. The small quantities of postmenopausal estrogens being produced by the ovaries and adrenal glands may have been holding pituitary activity in abeyance. Bilateral ovariectomy performed in this stable state was followed by marked worsening of the disease. Ovariectomy may have removed the small quantity of estrogen present, and a postoperative, relatively small rise in the level of urinary estrogens measured after acid zinc hydrolysis may have probably been attributable to increased adrenal estrogen output. It may be postulated that the rise in the urinary estrogen level was sufficient to drive the tumor into a state of activity. Hypophysectomy was performed, and it produced a clear but temporary stop in the progress of the disease; this could be explained either as a result of reduced stimulation of the adrenal gland and, therefore, a diminished estrogen output or by diminished stimulation of the tumor by pituitary factors.

Findings were similar in the 45-year-old patient, in whom a clear and sudden worsening of the disease took place after the ovariectomy. With bone metastases appearing right after the patient had passed through a normal menopause, it was possible that her ovarian estrogen production, although low, was serving more to suppress adrenal estrogen production or pituitary activity than it was to stimulate her tumor. In the 44-year-old patient ovariectomy was followed by excellent subjective and objective improvement for 9 months, suggesting the presence of an estrogen-stimulated tumor. When symptoms began to worsen, a bilateral adrenalectomy was performed. This, however, accelerated the tumor growth, and the administration of cortisone failed to stop it. The explanation for this acceleration may be that cortisone was being converted to estrogen. The finding of raised urinary excretion of estrogens in this patient indicated that biologically significant quantities of estrogenic compounds either were being secreted or were being converted from other steroids. The factor of possible adrenal remainders as a source of estrogen secretion was ruled out by their absence at autopsy. Complex observations of urinary calcium excretion in this patient suggested that changes in the uninvolved skeleton, or the balance between bone destruction and osteoblastic metastases, may mask the underlying progression of the process.

While the tumors in these 3 patients were quite definitely estrogen-stimulated, the 4th patient (the 49-year-old woman) may have had a true direct pituitary stimulation. It was believed that ovariectomy had made this patient's disease progress rapidly by releasing the pituitary gland from estrogen inhibition. In an attempt to stop the tumor growth, massive doses of cortisone were given, and then hypophysectomy was performed; however, the urinary calcium excretion continued to rise to levels as high as 1,030 mg. per day, and the patient died within 1 month after the hypophysectomy. The probability that the accelerated growth of metastatic breast cancer in these 4 patients has been due to the release of pituitary activity, previously held in check by estrogens, has been considered. Women in the menopausal period are most vulnerable to exacerbations of their disease as a result of ovariectomy or adrenalectomy.

Current Aspects of Cesarean Section and Prenatal Mortality. J. E. Hall, S. G. Kohl and H. R. Schechter. Am. J. Obst. & Gynec. 75:387-395 (Feb.) 1958 [St. Louis].

The data for this study were obtained from 10 hospitals, most of which are affiliated with medical schools. These data were gathered under uniformly specified conditions and constitute a sample sufficiently large and recent to yield pertinent information. There was a total of 85,556 single deliveries.

of which 3,816 were by cesarean section, an incidence of 4.46%. There were 1,597 secondary and 2,219 primary operations. The gross perinatal mortality in the primary group was 9%; it was 2.9% in the repeat group. Eliminating deaths prior to labor, these figures are corrected to 6.3 and 2.5% respectively. The perinatal mortality in mature infants, corrected by eliminating deaths prior to labor, was 2.5% in the primary group and 0.9% in the repeat cesarean sections. The type of anesthesia is not an important factor in the cause of perinatal mortality. In the uncomplicated elective repeat cesarean section, the perinatal loss was not affected by performance of the section prior to rather than at the onset of labor.

Although there has been a broadening of the indications for cesarean section in recent years, the incidence has not changed appreciably. The incidence at any particular institution must be appraised separately for primary and repeat cesarean sections, for it may well be higher in an institution committed to the policy of "once a cesarean, always a cesarean." This method of delivery does not guarantee a normal live baby. There is a considerable perinatal loss, often due to the complication that is the indication for the cesarean section. However, there is at least a 1% perinatal loss in the uncomplicated elective repeat section. This raises the question whether there would be more selection of previous cesarean patients for elective vaginal delivery. It is almost impossible to foretell which cesarean scars will rupture, and if rupture does occur, there is a 10% perinatal loss. This high perinatal mortality seems to point to the advisability of preventing the catastrophe of rupture of the uterus by performing routine repeat cesarean sections. However, it was found that all the perinatal loss occurred in the 36th to 37th week of gestation, which is much earlier than most workers would do an elective routine repeat cesarean section. This aspect of cesarean section should receive more study. Rupture of a previous cesarean section scar may follow either classic or low-flap types, however, the rupture of a previous classic scar is much more serious for the life of the fetus, since all the perinatal loss in this series was in such cases. Each case must be individualized to determine which method of delivery is most likely to assure a live baby and an undamaged mother.

PEDIATRICS

Observations on Tuberculosis Caused by Intramuscular Inoculation in Children. H. Habel. Ztschr. Tuberk. 110:156-162 (No. 3 & 4) 1957 (In German) [Leipzig].

The author observed 9 children, ranging in age from 3 months to 8 years, who contracted tuberculosis apparently as a result of intramuscular injections of virulent tubercle bacilli. These children had received injections, mostly of penicillin, with the same syringe, although the cannula presumably had been changed. All the children had been hospitalized during the same period of 4 months, in the same department, in the same hospital, so that there was an uninterrupted chain of contacts. Tuberculous abscesses developed in the gluteus and quadriceps femoris muscles, and the regional lymph nodes in the inguinal region likewise became abscessed in most cases. The primary tuberculous complex that had developed in this manner became disseminated in 1 patient in the form of a miliary tuberculosis in the lungs, in another patient in the form of a lymphadenitis of the cervical lymph nodes, and in still another as an extensive gravitation abscess in the small pelvis. Tubercle bacilli could be demonstrated in the pus of the abscess in 7 children; in 1 of these the bacilli were identified as the human type by 2 different laboratories. In another child histological studies demonstrated tuberculous granulation tissue, and in the last child the diagnosis was based on the results of treatment, on the history, and on the clinical picture.

One of the children had been treated with BCG vaccine shortly after birth. In this child a primary focus developed 3 months after the inoculation of tubercle bacilli, which was removed by extirpation. No involvement of the lymph nodes developed, either because of the BCG vaccination or because the tuberculous focus had been extirpated. Dystrophy and a greatly impaired general condition were particularly noticeable in the young children of this group. Treatment consisted in the administration of isoniazid and the local instillation of streptomycin. Healing of the abscess with cicatrization required from 4 to 6 weeks, but in the patient with gravitation abscess 9 months were required. Complete physical recovery required several months in practically all the patients. It is emphasized that for intramuscular or subcutaneous injections it is never permissible to use the same syringe in several patients without sterilization, because even if the cannula is changed, erythrocytes as well as pathogenic organisms may become lodged in the neck of the syringe and thus are passed on to the next patient.

The Rising Incidence of Scurvy in Infants: A Challenge to the Physician and the Community. W. S. Whelen, D. Fraser, E. C. Robertson and H. Tomczak. Canad. M. A. J. 78:177-181 (Feb. 1) 1958 [Toronto].

A decided rise in the incidence of infantile scurvy has been noted in the Toronto area and in Winnipeg. The authors summarize the clinical findings, feeding histories, and errors in diagnosis associated with the treatment of 79 patients on the wards of the Hospital for Sick Children, Toronto, during the 5-year period 1951-1955. In reviewing the admissions for scurvy to this hospital during the past 26 years, it was observed that the average annual incidence was 7 cases until 1953; then in 1954 there were 46 cases and in 1955 there were 25. Nearly 90% of the 79 patients were between 6 and 12 months of age. In a few the symptoms had appeared a few days before admission, but, on the average, they had been present for 3 weeks and were increasing in severity. Abnormal irritability was noticed, especially when the diaper was changed. More than half of the infants lay in the typical "frog position," which often suggested a diagnosis of paralysis. A hemorrhagic tendency was present in 50%. Although this most commonly occurred as hematomata around the teeth causing swollen blue gums, some infants had petechiae, hematuria, and other more serious hemorrhages. The majority of the patients were anemic, some severely so. Stepping of the costochondral junctions (Barlow's sign) was present in practically every patient. In only 1 case was clinically detectable rickets associated with the scurvy.

In most of the cases, the diagnosis was readily made. In some, the diagnosis was not established until the clinical response to treatment had been observed. In a few, other diagnoses were originally considered, such as poliomyelitis, neuritis, acute rheumatism, congenital dislocation of the hip, leukemia, anemia, spinal cord tumor, rickets, osteomyelitis, and muscular dystrophy. Discussing the recent increase in infantile scurvy, the authors conclude that, despite parental claims to the contrary, an inadequate intake of vitamin C was, in every case, the cause of the scurvy. The present-day decline in the use of orange juice in infant feeding is thought to be correlated with the recent rise in the incidence of scurvy. The modern policy of recommending multiple vitamin preparations may be less reliable in the prevention of scurvy than was the custom of including orange juice in the infant's diet. Experimental evidence is presented which disposes of the frequently expressed belief that the antiscorbutic effect of orange juice is destroyed by boiling. Recommendations for the therapy of acute scurvy are presented, and an educational program is suggested to aid in the elimination of this readily preventable disease.

DERMATOLOGY

Cryptococcosis: Case with Unusual Skin Lesions and Favorable Response to Amphotericin B Therapy. R. G. Crounse and A. B. Lerner. A. M. A. Arch. Dermat. 77:210-215 (Feb.) 1958 [Chicago].

The patient was a 62-year-old man, who was seen in the dermatology outpatient clinic of the Grace-New Haven Community Hospital in July, 1956, with the chief complaint of chronic skin ulcers. Except for the skin, physical findings were normal. Behind each ear there was a triangular ulceration, approximately 5 sq. cm. in area, which had a clean punched-out border, a smooth granulating base, and little surroundings inflammation. Similar lesions, although smaller, were noted over the right elbow and right pectoral region. On the forehead and extending upward over the anterior part of the scalp, there was an irregularly outlined, nontender, infiltrated, shiny erythematous plaque, several centimeters in diameter. There were several circular erythematous papules, with rolled borders and crusted depressed centers, on the face, neck, and left arm. All lesions were essentially asymptomatic except for a burning sensation associated with the postauricular ulcerations. Tissue sections for biopsies taken from 3 different sites revealed an encapsulated, yeast-like organism in the dermis and the epidermis. Mycological studies, including direct wet preparations and cultures on Sabouraud's mediums, showed a similar organism. Inoculation into white Swiss mice proved its pathogenicity. The use of special mediums, fermentation, and carbon-assimilation reactions confirmed the identification of Cryptococcus neoformans. Urine and sputum cultures also were positive for the organism, but tests of blood and spinal fluid were negative.

The patient was treated with a new antifungal agent, Amphotericin B. The initial oral administration of this agent had no visible therapeutic effect on the skin lesions. Later when Amphotericin B was given in the form of intravenous infusions, the skin lesions improved, and urine and sputum became free of organisms. However, when treatment was discontinued, relapses occurred. At the time of the writing of this paper, the patient had no active lesions and was on maintenance therapy with Amphotericin B.

Recent Developments in Surgical Skin Planing. S. Ayres III, J. Walter Wilson and R. Luikart II. California Med. 88:127-132 (Feb.) 1958 [San Francisco].

The use of steel-wire brushes has been virtually abandoned in surgical skin planing. Two types of abrading disks have proved to be preferable. The safest is a metallic disk, the periphery of which is covered with securely embedded, sharp-pointed diamond or ruby chips. These jeweled fraises are capable of cutting to any reasonable depth but only in an adequately frozen area. A stainless-steel disk with a serrated cutting edge has also been found useful. The results of experiments on the comparative effects of refrigerants on animal and human skin indicate that human facial skin can tolerate considerable freezing with ethyl chloride or dichlorotetrafluoroethan (Freon 114) but that mixtures containing large proportions of the much colder dichlorodifluoromethane (Freone 12) may be undesirable. Refreezing an area of the skin in order to perform a more adequate planing is not considered hazardous. The authors list clinical landmarks that indicate the depth of planing, that can serve as a guide to the operator, and that can be correlated with microscopic findings. Refreezing may be necessary at a depth below 2 mm.

In addition to acne pits and wrinkling, multiple actinic (senile) keratoses are an important indication for planing. Planing provides a nonscarring method for the treatment of existing keratoses, as well as a prophylaxis against skin cancer by replacing the sun-damaged, precancerous epidermis with new epidermal cells derived from the cutaneous adnexa (pilosebaceous and sweat gland units). The regeneration of the skin after planing has 3 components: epidermal, adnexal, and dermal. The cells of the epidermis and the adnexa are equipotential. A knowledge of the anatomy of the acne pit enables the operator to decide which pits can be benefited by planing and which should be excised before planing. It is the practice of the authors to remove, either by elliptical excision and suturing or by a punch, pits obviously too deep for safe removal by planing. This is done 3 or more weeks before planing, and any suture marks resulting can then be planed along with the pits. Evidence is cited to show that planing of the face is not absolutely contraindicated in a person with keloidal diathesis. One of the authors performed face planings on 3 patients with pitted acne scars who had typical keloids elsewhere on the body (presternal area and arms). In each case a small test area was first planed on the face; then, no untoward reaction having occurred in 6 weeks, the full face was planed. All 3 patients had an entirely satisfactory course.

UROLOGY

An Analysis of Five Hundred Percutaneous Renal Biopsies. R. M. Kark, R. C. Muehrcke, V. E. Pollak and others. A. M. A. Arch. Int. Med. 101:439-451 (Feb.) 1958 [Chicago].

The authors report symptoms or complications which appeared during or after the securing of material for 500 percutaneous renal biopsies. The excisions were performed on 368 patients with diffuse renal disease who were considered able to undergo the procedure without danger and in whom a clear diagnosis had not been established previously. Definite symptoms or signs of complications were observed during or after the taking of 49 biopsy specimens (9.8%). There were no deaths, and no patient required an operation. Anuria was not observed. The only serious complication was perirenal hematoma, which was seen in 3 patients and which was treated conservatively. Renal colic occurred in 14 patients, and 3 had prolonged hematuria. These 2 complications were readily controlled with simple measures. Renal tissue was obtained in 465 (93%) of the 500 biopsies; the tissue was adequate for pathological diagnosis in 401 biopsies (80%). The usefulness of the procedure far outweighs the associated morbidity, and one may now consider that the percutaneous method of obtaining a renal biopsy specimen with the patient in the prone position is a practical method which can be generally applied to the care of patients. Details of modifications in technique which have proved useful are given.

Exfoliative Cytology of Urinary Sediments: A Review of 2,829 Cases. N. C. Foot, G. N. Papanicolaou, N. D. Holmquist and J. F. Seybolt. Cancer 11:127-137 (Jan.-Feb.) 1958 [Philadelphia].

The efficacy of cytological examination of urinary sediments in the detection of carcinoma of the genitourinary tract was studied in 2,829 cases, which were grouped according to the final clinical diagnoses under (1) bladder, ureters, and renal pelves, (2) kidney, and (3) prostate. The greatest accuracy of cytological reports was achieved for tumors of those structures that are lined with transitional epithelium (bladder, ureters, and renal pelves). In 212 cases, 61.7% were correctly interpreted as positive on examination of the smears. A relatively low degree of accuracy was attained in the patients with renal tumors; 8.3% of the cancer-bearing patients furnished urinary specimens leading to correct positive reports. The high proportion of false-negative cytological reports is felt to be attributable in large measure to the fact that (1) parenchymal tumors of the kidney do not exfoliate into the urinary passages until late in the development of the neoplasm and that (2) most of the specimens consisted of urine collected from the bladder. The authors believe that retrograde catheterization of the upper portions of the urinary tract would presumably have yielded better results.

Fifteen per cent of patients harboring carcinoma of the prostate were cytologically positive. This demonstrates that a sample of urine is not the specimen of choice in detecting cancer of the prostate. Although only few specimens of fluid obtained by prostatic massage were submitted to the cytological laboratory in this series, it would appear from the results obtained by other investigators that this would be a more appropriate type of specimen for study. False-positive reports were rendered in 1.2, 1.0, and 1.0% of each of the 3 groups of cases respectively. Correct negative reports were issued on 90.8, 92.5, and 89.3% respectively. Confusion in cytological interpretation was found to be caused in a few instances by such nonmalignant conditions as renal calculus and chronic cystitis. The value of examining repeated specimens cannot be disputed, but in 60% of the over-all cases, correct cytological interpretations were rendered on the first specimen submitted. In the group of vesical carcinomas alone, this percentage of initial positive reports was 77.5%.

Incontinent Epispadias: Reconstruction of Bladder Sphincter by Musculofacial Slings (Report of 3 Cases). M. Mukherji. Indian J. Surg. 19:393-400 (Dec.) 1957 (In English) [Madras, India].

The author reports on 3 Hindu boys, aged 13, 10, and 16 years, respectively, with epispadias complicated with incontinence of urine. They were operated on by reconstruction of the sphincter of the bladder, Millin's sling operation for stress incontinence being used as a pattern. A transverse curved incision was made from one anterosuperior iliac spine to the other, the center of the curve reaching an inch from the upper margin of the epispadias. A medium-sized catheter was introduced into the bladder and was fixed to the prepuce. Two strips of fasciomuscular slings were prepared from the exposed and cleaned aponeurotic layers of the abdominal wall and passed through the middle of the rectus abdominis muscle of the respective sides. A strong silk suture was introduced into the tip of each sling with the aid of an aneurysm needle; the slings then were passed across the posterior aspect of the neck of the bladder to the opposite side. Then the fascial portions of the slings were encircled round the neck of the bladder and sutured onto their respective bases, making a tight ring round the neck of the bladder. It is not advisable to dissect the neck of the bladder thoroughly, because then the slings have a tendency to curl upwards onto the base of the bladder. It is best to make 2 holes across the posterior aspect of the neck of the bladder in between the adhesions of the neck with the anterior rectal wall. The operation was completed by suturing the margins of the gap in the aponeurotic layer of the abdominal wall.

The urine was drained through the catheter for 10 days, and the stiches were removed after 8 or 10 days. The control on the bladder neck developed slowly and in gradually increasing capacity. In the course of 2 or 3 months the patients were able to hold the urine for hours. The operation for correction of the epispadias was performed about 1 month after the reconstruction of the sphincter. The patients were followed from 6 months to 2½ years after the operation, and all 3 obtained a complete cure.

OPHTHALMOLOGY

Use of a New Carbonic Anhydrase Inhibitor (Cardrase) in Glaucoma. A. Posner. Am. J. Ophth. 45:225-227 (Feb.) 1958 [Chicago].

Cardrase (6-ethoxybenzothiazole-2-sulfonamide), a new potent carbonic anhydrase inhibitor, was given to 20 patients with various types of glaucoma. Twelve patients had chronic open-angle glaucoma, 3 had chronic noncongestive angle-closure glaucoma, 1 had secondary glaucoma caused by peripheral anterior synechias secondary to surgical intervention for angle-closure glaucoma, 2 had secondary glaucoma caused by essential atrophy of the iris and by posterior dislocation of the lens, respectively, 1 had a pigmentary glaucoma, and 1 had congenital glaucoma in a microphthalmic eye complicated by operation for cataract. Eight of the 20 patients had been treated previously with acetazolamide (Diamox), so that a comparison between the 2 drugs as to effectiveness could be made. The dosage of Cardrase varied from 31 mg. given 2 or 4 times a day through 62.5 mg. given 2 or 4 times a day to 125 mg. given 2 times a day. In general, 1 tablet (125 mg.) of Cardrase appeared to be equivalent to 1 tablet (250 mg.) of acetazolamide. Cardrase was generally well tolerated. Treatment with Cardrase had to be discontinued in only 2 patients because of side-effects, especially nausea and weakness. Both patients had been unable to tolerate even minute doses of acetazolamide (62.5 mg.). Cardrase is effective in lowering ocular tension in glaucoma; it proved to be twice as potent and equally as well tolerated as acetazolamide. Cardrase may be administered orally in dosages of 62.5 to 125 mg. 2 to 4 times daily.

Final Results of Extraction by Magnet of 193 Intraocular Foreign Bodies. H. Schenk and U. R Nemetz. Klin. Monatsbl. Augenh. 132:71-77 (No. 1 1958 (In German) [Stuttgart, Germany].

If iron splinters are lodged in the anterior portion of the eye, removal by electromagnet generally presents no problem, but extraction of such foreign bodies from the posterior portion of the eyeball may prove difficult. Two techniques have been in use for removal of foreign bodies from the posterior portion of the eyeball, Hirschberg's which uses the small hand magnet and Haab's which resorts to the giant magnet. Hirschberg, after making a radial scleral incision, extracted the foreign body from the vitreous with the hand magnet. After Haab in 1892 had introduced the use of the giant magnet, the foreign body was generally first drawn by magnet into the anterior chamber and then was extracted by incision. Opinions as to which of these 2 methods is better have been divided. The case material of the first eye clinic of the University of Vienna provided an opportunity to compare these 2 methods of extraction. Before 1945 extraction of intraocular foreign bodies had generally been done with the aid of the giant magnet by way of the anterior chamber of the eye. After 1945, however, the foreign body was generally extracted by the diascleral route with the aid of the hand magnet. Of a total of 193 intraocular foreign bodies, 88 were extracted with the giant magnet and 105 by means of the diascleral route with the hand magnet.

In surveying the total number of cases, it was found that both methods of extraction produce favorable results. However, as regards postoperative inflammation as well as the incidence of traumatic cataracts, the method of extraction through the anterior chamber seems to be less favorable than the diascleral extraction. Although some observers reported a relatively higher incidence of retinal detachment after diascleral extraction with the magnet, the authors did not notice this. In their experience, detachment of the retina was no more frequent after diascleral extraction than after extraction by way of the anterior chamber. For this reason, the authors intend to give preference to the diascleral extraction in the removal of intraocular foreign bodies. They prefer extraction by way of the anterior chamber only in patients in whom the anterior portion of the eyeball has been severely injured, the lens has been penetrated, and the ciliary body has probably been damaged, because then the method may avoid further damage to the eye.

OTOLARYNGOLOGY

An Explanation of the Pathogenesis, Physiology, and Therapy of Ménière's Disease. M. Murray and W. R. Stewart. A. M. A. Arch. Otolaryng. 67:184-196 (Feb.) 1958 [Chicago].

Over a period of years the authors have subscribed to and utilized the concept of focal infection in Ménière's disease as advanced by earlier investigators. They give the following explanation: 1. Endolymphatic hydrops is the result of changes in the water-holding capacity of the colloidal structures due to toxins or organismic invasion, specifically infected foci. 2. The infected foci predominate within the structures of and around the teeth and/or sinuses, but other areas of infection (tonsils, tongue, adenoids, gallbladder, etc.) may be causative in some cases. 3. Young's work supports the focal infection theory by presenting an anatomic framework showing lymphatic pathways upon which organisms and/or toxins could travel. 4. Routine sinus x-rays and diagnostic irrigations often fail to show infection when such is present. 5. Infected foci are not necessarily removed by routine teeth extractions and/or Caldwell-Luc procedures. 6. Bite problems often introduce a variable associated with the temperomandibular joint, complicating the true symptoms of Ménière's disease and necessitating establishment of normal dental occlusal planes. 7. Removal of infected foci attacks the cause of labyrinthine hydrops and, as such, must be considered superior to the symptomatic therapeutic approaches.

Metastasis from Glomus Jugulare Tumors: Discussion of Nomenclature and Therapy. H. Rosenwasser. A. M. A. Arch. Otolaryng. 67:197-203 (Feb.) 1958 [Chicago].

The author inquires into 3 of the unsolved problems of glomus jugulare tumors. First, he inquires whether these tumors are benign or whether they form metastases. He presents the histories of 2 patients to show that these tumors metastasized to the thoracic spine and to the ribs. The incidence of metastasis from glomus jugulare tumors will be determined in the future, as the awareness of the possibility of metastasis stimulates the search for metastic foci. The second problem discussed is that of nomenclature. When the author and Otani first studied one of these tumors they used the term "carotid-body-like tumor" because of the strikingly identical morphology with known carotid-body tumors in the neck, but they were aware that this is not an ideal term. They explain why they regard Winship's term "glomus jugulare tumor" as a good one. They also comment on the following terms: nonchromaffin paraganglioma, chemodectoma, receptoma (from chemoreceptor organ), glomerocytomas, and tympanic-body tumors.

As regards the third problem, the therapy, the author expresses the opinion that a rational therapy can be recommended if one attempts to classify the stages in which one sees these tumors. Many observers have been impressed with the relative ease in coping with these tumors when they are small and confined to the middle ear. Rational therapy in these instances would be elevation of the drum and complete ablation before the hearing is seriously impaired and before local invasion of the adjacent structures takes place. In the instances in which the tumor has eroded the tympanic membrane and the mastoid bone, and secondary infection has taken place, often presenting the picture of middle-ear suppuration, a radical mastoidectomy is indicated. If it is possible to remove all the tumor, the author witholds irradiation, but if it is doubtful that all the tumor is resectable, he follows it with irradiation, preferably radioactive cobalt (CO^{60}) therapy. Late in the course of the disease, when there is obvious extensive involvement of the mastoid and the petrous bone and intracranial involvement, the patient's interests will be served best by resorting to irradiation rather than to extensive mutilating surgery.

The Development of Stapes Surgery After Five Years: Mobilization—Fenestra Ovalis. S. Rosen. A. M. A. Arch. Otolaryng. 67:129-141 (Feb.) 1958 [Chicago].

The author describes and evaluates the 3 techniques he has developed for the improvement of hearing in deafness due to otosclerosis. The first method is the mobilization of the stapedial neck, the "indirect" method; the second is the direct mobilization of the footplate of the stapes; and the third is the opening through the oval window. The results of the fenestra ovalis technique are described in detail. A statistical analysis of 254 alphabetically consecutive cases (surnames beginning with A to E), including all cases from the most to the least suitable, revealed that 77% of patients subjected to stapes surgery one or more times by any or all of the above techniques obtained significant improvement to various levels of hearing.

THERAPEUTICS

Cerebral Cardiac and Pulmonary Accidents Ascribed to the Combined Action of Serum Therapy and Penicillin. J. Turiaf, P. Marland, J. Tabart and F. Dureau. *Semaine hôp. Paris.* 34:277-279 (Jan. 28) 1958 (In French) [Paris].

A 57-year-old woman was admitted to the hospital for an infective wound of the left leg sustained in an accident 8 days before. She was treated with an injection of 3,000 units of antitetanic serum and daily received an intramuscular injection of 1 million units of penicillin combined with 1 Gm. of streptomycin. The total dose of penicillin administered exceeded 10 million units. There was rapid clearing of the wound, and cicatrization started, but 7 days after the institution of the treatment the patient's temperature rose to 39 C (102.2 F), and it varied between 38 and 39 C (100.4 and 102.2 F) for 6 days. Myalgia and arthralgia were present. The patient was almost comatose, with disorientation and loss of memory. In the lower extremities there was a white, soft, painless edema. Headache, meningeal signs, and neurological foci were absent. There was no loss of pupillary reflexes. The ocular fundus was free from edema and other changes. A chest roentgenogram showed a vaguely rounded opacity in the lower lobe of the left lung near the apex of the heart, but this pulmonary infiltration was clinically silent, without pleural effusion in the adjacent area. Arterial hypotension and a disturbance of conduction, as shown by the electrocardiogram, with an isolated prolongation of the P-R interval to 0.24 second, revealed that the heart was affected. There was microscopic hematuria. The blood count revealed a hyperleukocytosis without associated eosinophilia. There was total hyperglobulinemia with hypergammaglobulinemia and hyperfibremia. Sensitivity tests for antitetanic serum and penicillin yielded positive results. Antibiotic therapy, therefore, was discontinued. The patient's temperature dropped to 37 C (98.6 F) within 24 hours, the edema disappeared within several days, and spontaneous recovery occurred. These observations show that antitetanic serum therapy and penicillin therapy sometimes provoke manifestations of an allergic type which may assume unusual and misleading aspects.

Five Years of Research and Clinical Experience on *Para-aminosalicylic Acid Hydrazide.* G. Orestano. Minerva med. 48:4091-4097 (Dec. 5) 1957 (In *Italian*) [*Turin, Italy*].

Experimental studies with *p*-aminosalicylic acid hydrazide were performed in vitro and in vivo (in guinea pigs) to evaluate its chemotherapeutic antituberculous properties. The action of *p*-aminosalicylic acid hydrazide in vitro on human strain of Mycobacterium tuberculosis showed a pronounced growth-inhibiting property. *P*-aminosalicylic acid hydrazide and isonicotinic acid hydrazide were given to 2 equal groups of 5 rabbits; each drug was given separately in an equal daily dosage of 25 mg. per kilogram during the first 50 days and of 50 mg. per kilogram each day afterwards. The form
drug produced a markedly lower degree of toxici
than the latter. All animals of the group which
ceived isonicotinic acid hydrazide died within
experimental days; at autopsy degenerative lesi
in the liver and kidneys were found. Of the gro
which received *p*-aminosalicylic acid hydrazi
only 1 animal died on or before the 68th da
whereas the others survived with symptoms of avi
minosis.

The antituberculous effect of *p*-aminosalicy
acid hydrazide was observed in 5 groups of
guinea pigs, which were artificially infected wi
Mycobacterium tuberculosis. Twenty days later
oral or subcutaneous treatment with *p*-aminosa
cylic acid hydrazide was given to all groups but
which was kept for control purposes. The drug w
administered in daily doses of 2.5 to 10 mg.
varying periods up to 120 days. The guinea pi
of the control group died within 40 days, the ave
age mortality period being 17 days. At autopsy di
fuse tuberculous lesions were found. Of 60 infect
and treated guinea pigs, 6 died as a result of t
free course of the infection, whereas in the remai
ing groups couple by couple were killed for t
purpose of autopsy examination on the 50th, 60
70th, 80th, and 90th days and the last 5 anima
on the 140th experimental day. Treated and kill
animals showed a lesser extent of the tuberculo
lesions than did those which died as a result of t
free course of the infection. The lesions in the a
mals of the latter group were similar to those
the guinea pigs in the control group. The opini

of the author is that *p*-aminosalicylic acid hydrazide is particularly efficacious for treatment of the chronic types of tuberculosis which are resistant to treatment with streptomycin, aminosalicylic acid, or isoniazid. *P*-aminosalicylic acid hydrazide can be intermittently administered for extended periods of time because of its low degree of toxicity.

A New Salt of Nonprocaine Penicillin for Prolonged Action. G. Orestano. Minerva med. 48:4107-4110 (Dec. 5) 1957 (In Italian) [Turin, Italy].

A new salt of nonprocaine penicillin of prolonged action, whose chemical name is 2,5-diphenylpiperazine bis-benzylpenicillin G, was studied with reference to the duration of the concentration in blood and its clinical effects in 2 groups of persons. A single, intramuscularly administered dose of 2,5-diphenylpiperazine bis-benzylpenicillin G amounting to 500,000 units was given to 14 persons; the same amount of procaine penicillin G was administered to 8 persons. Neither group had ever before received penicillin therapy. Serum specimens were obtained 2, 3, 12, 24, 32, 48, 72, and 96 hours after the administration of these 2 drugs. The 2,5-diphenylpiperazine bis-benzylpenicillin G proved to be a drug of prolonged action. This has been demonstrated by its concentration in blood of over 0.05 unit per cubic centimeter for a period of 48 or more hours after the administration of a single dose; the level persisted for 72 hours in 4 patients and for 96 hours in 2. A concentration of procaine penicillin G in aqueous solution of over 0.05 unit per cubic centimeter never persisted 48 hours after its administration; this level was maintained for only 32 hours in 4 patients and for 24 hours in 4.

Clinical effects of 2,5-diphenylpiperazine bis-benzylpenicillin G were studied in 45 patients who had an infectious disease or in whom the therapeutic effect of penicillin was already known. They received the drug in a single intramuscular daily dose of 500,000 units for a period of between 2 and 16 days. The patients tolerated the drug well. Two patients, in whom previous administration of procaine penicillin G produced unfavorable side-effects, had no complaint about 2,5-diphenylpiperazine bis-benzylpenicillin G. This new salt of nonprocaine penicillin has thus proved to have a more extended action and to be better tolerated by the patients than procaine penicillin G.

Allergic Accidents Caused by Corticotropin (ACTH). J. Charpin and A. Zafiropoulo. Semaine hôp. Paris. 34:274-276 (Jan. 28) 1958 (In French) [Paris].

The authors report on 11 patients, between the ages of 27 and 67 years, in whom allergic reactions to corticotropin (ACTH) were observed. Eight of the 11 patients were treated with corticotropin for asthma, 2 were treated for chronic bronchorrhea associated with dyspnea, and 1 was treated for late asthma in the form of spasmodic tracheitis. The allergic reactions to corticotropin consisted of severe urticaria or generalized pruritus, with reddening of the skin of the thorax and of the face in 10 patients. The urticaria was associated with Quincke's edema in 1 patient and with generalized malaise in 3 patients. Status asthmaticus resulted from the treatment with corticotropin in 4 patients. The onset of the allergic reaction to the hormone varied with the individual patient; in 2 patients urticaria already occurred after the 1st injection, and in another it occurred only after the 9th injection.

The occurrence of an allergic reaction to a corticotropin preparation of pork origin, adsorbed on zinc hydroxide, in 9 of the 11 patients is not significant except for the fact that this type of preparation was used most frequently by the authors. Allergic reactions to preparations of corticotropin without delayed absorption also occurred and were even more severe. There likewise occurred allergic reactions to corticotropin preparations of mutton and beef origin as well as to those of pork origin. Tests performed with gonadotropic preparations and with a commercial extract of the posterior pituitary lobe gave positive results as did those performed with somatotropic hormone preparations (corticotropin of mutton and beef origin). These findings suggest that the patients were allergic to a protein that was present in all the pituitary extracts, whatever their functional specialization was. The nature of the vehicle used for delayed absorption did not play a part. The undesirable side-effects are not too severe if they are recognized in time and if administration of the hormone is discontinued. The latter seems advisable in the course of prolonged treatment with corticotropin as soon as the patient appears to be allergic to it.

Allergic Edemas in Isoniazid Therapy of Pulmonary Tuberculosis. G. Buchwald. Ztschr. Tuberk. 110: 152-155 (No. 3 & 4) 1957 (In German) [Leipzig].

A 56-year-old man, in whom tuberculosis was diagnosed in 1952, had been treated with isoniazid from November, 1952, to October, 1953. He returned to the sanatorium in the summer of 1956, because his tuberculosis had become reactivated. Treatment with isoniazid was resumed, and after about 24 Gm. of the drug had been administered in 2 months, the patient awoke one morning with edematous swelling of the right eye. The upper and lower lids were soft and cushion-like; the skin was tense and glistening. Active opening of the palpebral fissure was impossible. The condition was diagnosed as an allergic edema. It subsided in 2 or 3 days. When several days later the patient was given an intramuscular injection of irgapyrine (a combination of phenylbutazone and aminopyrine), an edematous swelling, the size of a hand, developed below the site of injection; it resembled the earlier circumocular swelling. Pressure caused pitting of the edema. Later the swelling extended downward. After it had spread over the entire gluteal region and from the thigh down to the knee, it subsided in 2 or 3 days after antihistaminics and an antiallergic ointment had been used.

It was assumed that the injection of irgapyrine produced this allergic reaction. Several days later the ocular symptoms recurred in a more severe form, but this time the left eye rather than the right eye was involved. Regression required more time. It was now suspected that the edematous attacks were connected with the isoniazid therapy, and the patient was questioned about earlier attacks of this type. He admitted that in 1953, shortly before the isoniazid therapy was discontinued, he had had a swollen eye. Since the edematous attacks so far in 1956 had not been particularly annoying, it was considered unnecessary to interrupt the medication. Several days later, however, the eye symptoms recurred in a more severe form, the edema being not only much more extensive (forehead, temple, and cheek) but also painful, and the patient's general condition was impaired by malaise and lack of appetite. It was now decided to discontinue the isoniazid therapy for fear that edema of the glottis might occur. In this connection it is pointed out that other investigators observed 3 patients in whom edema of the glottis developed suddenly during treatment with isoniazid. Although tracheotomy was performed in all 3, only 1 survived.

PHYSIOLOGY

The Functional Capacity of the Kidney Denervated by Autotransplantation in the Dog. N. S. Bricker, R. A. Straffon, E. P. Mahoney and J. P. Merrill. J. Clin. Invest. 37:185-193 (Feb.) 1958 [New York].

Separate but simultaneous studies were performed on the 2 kidneys of 6 dogs with permanent hemibladders, having 1 kidney autotransplanted into the iliac fossa and the opposite kidney intact. This experimental method has several advantages: 1. Construction of 2 separate urinary bladders provides the opportunity to study the functions of both kidneys in a single animal simultaneously and serially. 2. Autotransplantation of 1 kidney only permits comparison of the data of the transplanted organ with its own pretransplantation values and with the concurrent responses of the intact organ. 3. The removal of a kidney from the body of the host during the transplantation procedure results in the severing of all renal nerves without interrupting nerves to extrarenal splanchnic structures. The studies presented were undertaken to define further the functional capabilities of the transplanted kidney and to examine the relationship between renal nerves and sodium excretion. Serial studies were also performed on 2 dogs in which unilateral denervation was accomplished by a conventional procedure.

The autotransplanted kidney in the dog demonstrated no persistent defect in any of the functional parameters examined. Complete denervation occurring during the transplantation procedure did not result in any consistent abnormality in the tubular transport of sodium chloride. The responses of the conventionally denervated kidneys did not differ in any major respect from the autotransplanted kidneys. Conventional denervation, as employed in numerous previous studies, therefore, appears to be a satisfactory means of depriving the kidney of its nerve supply. The possibility of nerve regeneration in the transplanted kidney has not yet been definitively studied. However, no consistent differences were noted between the long-term studies and those performed within 3 weeks of transplantation.

The Problem of Transfer of Thyroid Hormone Through the Placenta. M. Berger and S. Nelken. Presse méd. 66:62-63 (Jan. 15) 1958 (In French) [Paris].

The authors review the question of transmission of the thyroid hormone through the placenta, pointing out that previous studies on this problem have been few. They consider it inadvisable to investigate this question with iodides that have been tagged with radioactive substances, because it has not been proved that these substances might not be harmful to the fetus. They obtained consistent results by giving to the mother at the onset of labor an intravenous injection of thyroxin or by administering potassium iodide by mouth in a sirup vehicle. At birth they compared the protein-bound iodine content in the mother's blood with that in the infant's blood. In doing this, they obtained the following results: 1. The protein-bound iodine content of the blood of pregnant women is higher than that of nonpregnant women; this content is higher in the blood of the umbilical cord of the fetus than in the blood of the healthy adult. 2. Thyroxin does not pass the placental barrier, or, if it does so, it is a slow process; a gradient or a difference always persists between the thyroxin level in the mother and that in the fetus. 3. Iodine and iodides easily pass through the placental barrier.

Linear Deceleration Studies and Human Tolerance. F. Latham. Clin. Sc. 17:121-135 (Feb.) 1958 [London].

Twenty-two deceleration runs were carried out on 4 persons from the Royal Air Force Institute of Aviation Medicine, whose weights ranged from 150 to 175 lb. (68 to 79.4 kg.) and who wore standard Royal Air Force flying clothing. They were placed in a rocket-propelled trolley carrying the seat and equipment in the forward-facing position. Four types of harness providing restraint of the torso, but not of the extremities with the person strapped into the seat, were tested; the conventional harness comprised shoulder and lap straps only, and the combined harness comprised shoulder straps, lap belts, and crutch loops with either a 4-point or a 3-point attachment. The trolley was decelerated by a hydraulic ram at the end of the track. In addition to an accelerometer mounted rigidly on the trolley structure, a further accelerometer was attached to the person tested in the upper sacral region by means of a leather belt. The acceleration has been stated in terms of multiples of the force of gravity at the earth's surface, and thus a deceleration of 981 cm. per second per second has been referred to as 1 g. Additional channels were used for the recording of electrocardiograms, muscle-action potentials, and intra-abdominal pressures.

The limits of physiological tolerance to linear decelerations lasting 0.2 to 0.4 second were assessed, and results showed that a combined harness alone, which is proposed for use in service aircraft, should give protection up to 17 g, but above this figure serious injury is likely. The differences observed by joining the 2 shoulder straps to a common attachment, making a 3-point harness, were not significant. If additional leg restraint is employed, it is considered that the safe limit may be raised to at least 20 g. Above this figure, arm, leg, and head restraint and a jerkin harness should give protection up to 25 g. Attention is drawn to the possible mechanism of injury to the face, larynx, and chest. Peak intra-abdominal pressures of 450 mm. Hg at 10.8 g were recorded in 1 of the 4 persons tested. When the persons tested were relaxed before the impact, a protective extensor response in the lower extremities, tending to brace the person against the rudder pedals, was not detected less than 100 milliseconds after the impact.

The Role of Gastric and Duodenal Interoceptors in Blood Amylase Changes. G. F. Milyushkevich. Bull. Exper. Biol. & Med. (Translation from the Russian) 42:991-995 (Dec.) 1956 [New York].

The author carried out experiments on dogs in an attempt to elucidate the role played by the interoceptors of the gastrointestinal tract in the reflex changes of blood amylase after the intake of food and to establish the possible sources from which amylase could enter the blood stream. Dogs with gastric and duodenal fistulas and externalized pancreatic duct (according to Pavlov's technique) and. dogs with intestinal fistulas (according to Thiry's technique) were used. Stimulation of the mechanoreceptors was affected by inflation of a rubber balloon in the stomach up to 30 and 60 mm. Hg, the air content in the balloon being 250 and 500 cc., and in the duodenum up to 30 mm. Hg, the air content in the balloon being 100 and 250 cc. Stimulation of the chemoreceptors was carried out by the introduction of 100 and 200 cc. of 0.25 and 0.5% solution of hydrochloric acid and 50 cc. of fat into the stomach and 50 cc. of fat into the duodenum.

Stimulation of the gastric and duodenal mechanoreceptors for 30 minutes with the aid of the balloon led to increased blood amylase activity 15 to 45 minutes after cessation of the stimulation. Analogous results were obtained by the introduction of hydrochloric acid and fat into the stomach and of fat into the duodenum. An increase in the blood amylase activity after stimulation of gastric and duodenal mechanoreceptors and chemoreceptors occurred at exactly the intervals which usually correspond to the complex reflex phase of secretion of pancreatic juice. Previous studies by the author had shown that the greatest increase in blood amylase activity in dog and man was observed after the intake of food which consisted predominantly of fat. The present findings suggest that a neuroreflex mechanism is involved in those changes of blood amylase activity which arise under the action of fat. An increase in blood amylase activity, similar to that seen on constriction of the pancreatic duct after food intake, was observed on excessive stimulation of gastric chemoreceptors and mechanoreceptors. The increased blood amylase activity in dogs observed on artificial constriction of the pancreatic duct after food ingestion indicated that amylase may enter the blood stream directly from the pancreas. This was also confirmed by blood analyses carried out after various operations performed on the dogs, such as the production of a fistula of the gallbladder and intestine (according to Thiry's technique), an intestinal fistula, and a duodenal and gastric fistula, and the externalization of the pancreatic duct whether the accessory pancreatic duct is cut or is left intact. Increased blood amylase activity in dogs deprived of the entry of pancreatic juice in the intestine (externalized main duct, sectioned accessory duct) can only be explained by the direct penetration of amylase from the pancreas into the blood.

Analysis of the digestive juices in dogs, such as pancreatic juice, intestinal juice, bile, and saliva, revealed that only the pancreatic juice possesses high amylolytic activity. Consequently, marked changes in blood amylase activity in dogs cannot be explained by the appearance of amylase from digestive juices other than the pancreatic juice. Thus, it is possible to conclude that reflex mechanisms are important in changes of blood amylase activity. These findings indicate the role of gastric and duodenal interoceptors in the complex reflex regulation of blood amylase and allow the deduction that reflex increase of blood amylase activity is closely related to the function of the pancreas.

BOOK REVIEWS

Clinical Heart Disease. By Samuel A. Levine, M.D., F.A.C.P., Clinical Professor of Medicine, Harvard Medical School, Boston. Fifth edition. Cloth. $9.50. Pp. 673, with 216 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

In the fifth edition of this popular book, a number of changes have been made. The section on electrocardiography, by Dr. Harold D. Levine, occupies one-third of the book. This portion is well illustrated and is practically a textbook in itself on electrocardiography. Unfortunately, this emphasis on electrocardiography has necessitated compressing the material in the rest of the book. Although the chapter on congenital heart disease, now written by Dr. A. S. Nadas, has been brought up to date and includes surgical treatment of congenital defects, it occupies only 31 pages and contains no illustrations. As a matter of fact, there are no illustrations or diagrams in the book except in the section on electrocardiography. The explanation of the mechanism of heart failure on page 349 would be much clearer with the aid of diagrams. In a book written primarily for the general practitioner, it is understandable that a bibliography has been omitted, but it might be helpful to the reader to have a few well-chosen references listed at the end of each chapter. Emphasis is placed on treatment and general care of the patient. This feature is probably responsible for the fact that this book is now in its fifth edition. The general practitioner may find some useful information in this book. However, it is not recommended for the cardiologist or the medical student.

Integrating the Approaches to Mental Disease: Two Conferences Held under the Auspices of the Committee on Public Health of the New York Academy of Medicine. Edited by H. D. Kruse, M.D., Executive Secretary, Committee on Public Health, New York Academy of Medicine, New York City. Cloth. $10. Pp. 393, with illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1957.

This volume is large in size and scope. It is an ably edited record of the proceedings of two unusual conferences. The 48 participants represent four schools of thought on the cause of mental illness: organic, experimental psychological, psychodynamic, and psychosocial. This book illustrates a new and important trend in modern research in the behavioral sciences, a trend that attempts to cope with increasing specialization and fragmentation. The participants tried to establish what is ce tain, to recognize what is probable, and to sho what is unacceptable. As one contributor state "We deal not with opposing etiological theorie but with complementary approaches to the tot problem. None of these approaches can replace th other."

More than good will is needed to achieve a sy thesis from these diverse schools of thought. It the essential contribution of this and similar effor in the past few years that men, working with diffe ent ideas and experiences, learn, through workin and eating together, to communicate with the fre dom necessary for mutual understanding. Fillin the gaps between verbal agreement and operational agreement is what counts. This becomes particularly apparent where exponents of the different schools discuss what is most acceptable to each and in which areas there is least agreement. One day, the conferees were told by the chairman to try to agree as much as possible, and on another day they were told to try to disagree as much as possible. It was in psychodynamics that the other disciplines found most which they could not accept. How closely interdisciplinary and interpersonal problems are interwoven was evidenced by the participant who asked whether interdisciplinary research was to take place on the interpersonal or on the interdisciplinary level. One of the answers was that through better interpersonal understanding we will reach better interdisciplinary understanding. Through reading this book, one may view all areas from one vantage point. This book is highly recommended to anyone who is interested in the causes of mental illness.

Handbuch der Thoraxchirurgie. (Encylclopedia of Thoracic Surgery.) Erster Band: Allgemeiner Teil. Herausgegeben von E. Derra. Bearbeitet von O. Bayer et al. [In German and English.] Cloth. 370 marks. Pp. 838, with 441 illustrations. Springer-Verlag, Reichpietschufer 20, (1) Berlin W. 35 (West-Berlin); Neuenheimer Landstrasse 24, Heidelberg; Göttingen, Germany, 1958.

As the name implies, this first volume of a projected series of three volumes is indeed an encyclopedia. In the preface, the editor calls attention to the growth of thoracic surgery since the second edition of Sauerbruch's Chirurgie der Brustorgane 37 years earlier, spanning a whole generation of careers in this field. All subjects are treated in great detail. One-quarter of the book deals with the anatomy of the thoracic viscera, which is followed by a discussion of the physiology of respiration including those phases closely related to ches

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These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

surgery. Further covered are the following subjects: clinical diagnostic procedures, such as auscultation, percussion, endoscopy, esophagoscopy, bronchoscopy, thoracoscopy, cytology, and spirometry; roentgenography, as applied to the thorax; electrocardiography; cardiac catheterization and angiocardiography (in English); anesthesiology, as applied to chest surgery (in English); recent developments in controlled hypothermia; extracorporeal circulation, as an aid to cardiac surgery (in English); and such aspects of chest surgery as positioning of the patient, instrumentation, incisions for various thoracotomies, postoperative care of the opened chest, and blood and electrolyte balances. Each chapter includes an extensive bibliography, for the most part recent, and many references to contributions by surgeons in the United States. Twelve of the contributors are from West Germany, three from Sweden, one from Austria, and one from the United States. The book is large, heavy, and well bound, and the paper is of high quality. The type is large, facilitating easy reading. An outstanding feature is the profusion of excellent, well-chosen charts, tables, diagrams, illustrations, and photographs. In this respect, the work achieves the high standards of prewar German medical publications. This volume should be readily available to all who do thoracic surgery or are active in research directly related to this field. While a knowledge of German is necessary for full appreciation, the illustrations are so graphic and complete that full conversance with this language is not necessary to profit from this work.

Recent Advances in Urology. By Howard G. Hanley, M.D., F.R.C.S. With assistance of specialist contributors. Cloth. $7. Pp. 270, with 83 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6, 1957.

A rash of urologic textbooks has been published in English in the past three years. Despite this apparent plethora, the author and his associates have compiled a most useful volume on the current knowledge of the common genitourinary conditions. The chapter by Harrison, dealing with medical problems in urology, adequately covers the modern concept of renal physiology, renal function, water conservation, anatomy and physiology of body fluids, clinical effects of lack of salt and water, and treatment of these conditions. Chemotherapy of urinary infections is inadequately covered by Anderson. He very properly points out that patients with urinary infection include (1) those without abnormality of the urinary tract and without a prior history of urinary infection, who have a good prognosis as to lasting cure; (2) those with a previous history of infection, for whom the prognosis is only moderately favorable; and (3) those with a definite abnormality of the urinary tract, for whom the outlook is frankly poor unless corrective surgery can be undertaken. Discussion of radiology is limited to recent improvements in the media and technique used in excretory urography, abdominal and femoral aortography, perirenal insufflation, urethrography, and seminal vesiculography. A brief discussion of the x-ray image amplifier and cinepyelograms is given. The section on conservative renal surgery covers the technical considerations of modern pyeloplasty and partial nephrectomy. The chapter on bladder tumors is up to date and could be read with great profit by student and specialist alike. Prostatic obstruction from benign and malignant growths is well covered in all phases. An excellent chapter on subfertility is presented by Hanley, who has done much work along this line. The general flavor of the book is distinctly British, but emphasis is made that urology, as a special field of endeavor, is gradually becoming an established withdrawal from general surgery in England.

Operative Surgery. Volume Five: Orthopaedic Surgery. Under general editorship of Charles Rob, M.C., M.Chir., F.R.C.S., Professor of Surgery, St. Mary's Hospital, London, and Rodney Smith, M.S., F.R.C.S., Surgeon, St. George's Hospital, London. Cloth. $19.50. Pp. 366, with illustrations. [F. A. Davis Company, 1914-16 Cherry St., Philadelphia 3]; Butterworth & Co., Ltd., 88 Kingsway, London, W. C. 2; 1367 Danforth Ave., Toronto 6, Canada, 1957.

In volume 5 of this series, the drawings are excellent and clearly demonstrate the steps which make following the operative procedure easy. The legends are well worded. As in any volume of this size, there will be wide variations in recommended techniques. Some of the operations here illustrated have been supplemented or replaced by others that are more efficient. It should be stressed somewhere in the book that there are other methods of performing a similar operation. For example, in the operation for herniated intervertebral disk the only position shown is the lateral position. While this is a good position, most surgeons in the United States prefer the prone position, and frequently the operation is completed without such an extensive laminectomy as is here shown. Again the Bosworth H graft and the Chandler graft have been practically abandoned. In the chapter on plating of the spine, no mention is made of the plating operation of Phillip Wilson. Some discussion of the method of performing an arthroplasty of the elbow would have been helpful; only one method is given (that from the medical approach), whereas the posterior approach may also be used. This is, in general, an excellent reference book, particularly for the young surgeon if he correlates the indications for operation, as set forth in the standard textbooks, and then uses this volume as a guide to his operative techniques.

Strabismus Ophthalmic Symposium II. Edited by James H. Allen, M.D., Professor and Chairman of Department of Ophthalmology, School of Medicine, Tulane University of Louisiana, New Orleans. Cloth. $16. Pp. 552, with 251 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

This book is based on the second symposium on strabismus, sponsored by the New Orleans Academy of Ophthalmology. The panel was composed of the same group of contributors who met six years earlier in Iowa City for the first symposium. These collected papers represent a veritable encyclopedia on strabismus, commencing with the anatomy of the extrinsic muscles of the eyes, the physiology of binocular vision and the fusional process, the voluntary and involuntary mechanism of the eye movements, and the blind-spot mechanism. The various diagnostic tests, such as the cover test, and the practical use of atropine and prisms are carefully evaluated and explained. The nonsurgical and surgical treatment of strabismus, with emphasis on such more difficult operations as those on the oblique muscles and the newer recession under Tenon's capsule, is reported by K. C. Swan. This is followed by a round-table discussion with a free exchange of ideas and experiences. One of the most refreshing chapters is the one on semantics by the late W. B. Lancaster. His admonition that precision in the use of words is indispensable for clear thinking assumes greater and greater importance, because the exact expression of ideas is impossible without such precision. It is not enough to use terms with consistency and precision—one should follow the usage of the best writers on the subject. This book should be in the library of every ophthalmologist who treats strabismus.

Metabolism of the Nervous System. Edited by Derek Richter. Cloth. $16. Pp. 599, with illustrations. Pergamon Press, Inc., 122 E. 55th St., New York 22; 10638 S. Wilton Place, Los Angeles 47; 4 & 5 Fitzroy Sq., London, W. 1, England; 24 rue des Écoles, Paris 5e, France, 1957.

This volume, well printed, attractively bound, and provided with numerous tables and excellent illustrations, contains the papers presented at the Second International Neurochemical Symposium (Aarhus, 1956). Although most of the book is devoted to the metabolism of the peripheral and central nervous system, the symposium covers more territory than is suggested by the title, as indicated by sections on molecular structure and morphology, the permeability of the blood-brain barrier, electrolytes and nervous conduction, cholinergic and noncholinergic transmission, and the physiology and biochemistry of levarterenol, serotonin, and histamine. Most sections consist of one or two papers in which the present state of the problem is reviewed. These are followed by shorter papers concerned with more specialized aspects. The presentations are uniformly of the highest caliber. The references are adequate and the discussions brief. The book is an outstanding achievement and is highly recommended.

Extensile Exposure. By Arnold K. Henry, M.B., M.Ch., F.R.C.S.I. Second edition. Cloth. $10. Pp. 320, with 198 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1957.

The new edition of this informal, almost conversational presentation of exposures of the extremities is interesting. The author says what he wants to say in the way he wants to say it. If he finds it useful to use crutches or similes, he does so. Although many might disapprove of his use of teaching aids, there is much to be said in its favor. Such terms as "the half-sleeve," "loop-holes," "satellites," and "the stripping angle" are used abundantly. The author holds no brief for any terminology, but believes that the so-called new, old, and Basle each has its own points of merit. The book is well illustrated with figures that complement the author's style of writing. The print is large and readable and the paper excellent. This book can be recommended to anyone interested in the anatomy and surgery of the extremities.

Hospital Accreditation References: Foreword by Kenneth B. Babcock, M.D., Director Joint Commission on Accreditation of Hospitals; Introduction by Edwin L. Crosby, M.D. Director American Hsopital Association. Pp. 136. Paper Published by American Hospital Association, 1957.

The Joint Commission on Accreditation of Hospitals has developed into one of the most useful mechanisms devised up to the present time for improving medical care. Its accreditation program has become increasingly influential in the encouragement of good hospital care, and it has become an important facet in maintaining the freedom of the voluntary hospital system. To make the requirements, recommendations, and interpretations of the Joint Commission readily available for reference on the part of hospital administrators, boards of trustees, and staff personnel, the Joint Commission has prepared this comprehensive volume in collaboration with the American Hospital Association. It portrays the background and development of the Joint Commission in the first chapter, with the remaining 23 chapters devoted to various aspects of accreditation. This is a valuable reference volume for all individuals interested in or concerned with accreditation of hospitals.

QUESTIONS AND ANSWERS

HEMATOCRIT DETERMINATION VERSUS RED BLOOD CELL COUNT

To the Editor:—*As a part of an industrial medical program, complete periodic physical examinations are provided to employees. Laboratory work done in connection with these examinations includes red blood cell count, hemoglobin level determination, white blood cell count, and routine urinalysis. A bottleneck exists in the laboratory time available. If laboratory work could be reduced, more examinations could be performed. The question has arisen as to the possibility of substituting hematocrit determination for the standard red blood cell count as a routine procedure. Please comment on the advisability of this change. Such a change is not being considered in those cases where the employee has possibly been exposed to toxic materials but would apply only to nonexposed individuals.*

R. E. Joyner, M.D., Texas City, Texas.

Answer.—According to leading authorities, the hematocrit determination furnishes the same kind of information as does the red blood cell count or hemoglobin level determination. Furthermore, the technique is easier and the accuracy greater. If the red blood cell count is done even by the most skilled and accurate technicians, with use of standardized equipment, the error is approximately 10%. It is approximately 20% if it is done by the average technician working hurriedly and under pressure. If the true red blood cell count is 5,000,000 per cubic millimeter, the range of variations may be from 4,000,000 to 6,000,000. The error in methods of determining hematocrit is about 2 to 4%. The hematocrit determination is the most useful single test for anemia and polycythemia at present available. The finding of a normal hematocrit in the course of a routine examination makes the red blood cell count and hemoglobin level determination unnecessary, except when the clinical history or physical examination suggests the need for further studies. In the case of individuals not exposed to toxic materials, a hematocrit determination is superior to the red blood cell count as a routine procedure.

THIOPENTAL AND DIABETES

To the Editor:—*Is there any contraindication to the use of thiopental in anesthesia in known diabetics, either with or without the preoperative use of dextrose given intravenously? A 41-year-old woman, severely diabetic since the age of 12, who had a 2+ glycosuria and a fasting blood sugar level of 237 mg. per 100 cc. preoperatively died after receiving thiopental during anesthesia. She received an intravenous infusion of 5% dextrose solution (covered with regular insulin in strength of 15 units per 1,000 cc. and 10 units of regular insulin given intramuscularly before operation) before, during, and after a simple excision biopsy of a breast tumor. There was no hemorrhage or other difficulty during either surgery or anesthesia. The anesthetic was administered by an experienced anesthetist. The patient was responding when she left the operating room, but an hour later she was less alert and two hours later was in a coma which was first believed to be insulin shock (but did not respond to dextrose) and later believed to be cerebral hemorrhage. She died on the sixth postoperative day. Autopsy failed to establish the cause of death. Laboratory studies during the period of prolonged coma effectively ruled out more than temporary insulin shock, diabetic coma, acidosis, alkalosis, chloride lack, and sodium and potassium imbalance. Does dextrose solution, as has been stated, intensify the effect of thiopental?*

Thomas S. White, M.D., Boulder City, Nev.

Answer.—There is no known contraindication to thiopental in anesthesia in diabetics. It has been used widely in all types of diabetics, for all types of surgery, in combination with dextrose.

Answer.—Thiopental is associated with a definite death rate, and there is no reason for supposing that diabetics would be immune to this hazard. If the diabetic had much arteriosclerosis, as presumably was the case in a woman 41 years old, that could be a factor. The use of thiopental is fraught with danger in the presence of myocardial disease and arteriosclerosis. The description of the present case, however, suggests that this was probably not the explanation for the fatal outcome, unless there was a marked period of hypotension. Such hypotension could have been a result of the combination of thiopental and the diabetic arteriosclerosis. The hypotension could then have fur-

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

PURPURA IN CIRCULATORY STASIS

To the Editor:—*What are the possible causes of a purpuric rash involving both lower extremities in a 50-year-old male? This skin rash is confluent around the ankles. Laboratory tests of coagulation time, bleeding time, differential blood cell count, platelet count, and blood chemistry have shown normal results.* *M.D., New York.*

Answer.—It is not unusual for a purpuric eruption of the legs to occur in a patient without abnormal blood changes. It may result from the increased hydrostatic pressure of stasis brought on by impeded circulation. There is also a group of apparently harmless pigmented purpuric eruptions which, because of morphologic variations, have been given the descriptive names of pigmented purpuric lichenoid dermatitis, progressive pigmentary dermatosis, angioma serpiginosum, and purpura annularis telangiectodes. An increased hydrostatic pressure with capillaritis of unknown cause is thought to be responsible for all of these conditions. It is assumed that the possibility of hypersensitivity to drugs has been ruled out in this case.

PROPER NEEDLE FOR VENIPUNCTURE

To the Editor:—*Is there any reason why one should not use a small-gauge needle for venipuncture? On a number of occasions a 25-gauge needle has been used without trouble with its blocking. It seems to provide easier entrance into a small vein and to afford the patient less discomfort.* *E. Llewellyn-Thomas, M.D. Freeport, Nova Scotia.*

Answer.—There is no reason why a small-gauge needle, even a 23-gauge needle, should not be used for venipuncture. If large specimens of blood are to be obtained with such a needle, it should be siliconized to retard coagulation. The only possible objection is that if a high vacuum is used in connection with such a needle or if the syringe piston is withdrawn too rapidly there may be minimal red blood cell breakage. This would interfere with the determination of free hemoglobin level in the plasma.

TREATMENT OF INFLUENZA

To the Editor:—*A patient has asked about a new drug of which only one shot is required for the treatment of influenza. Please give information on such a medicament.*
J. O. Helm, M.D., New Florence, Mo.

Answer.—There is no treatment available at this time which will alter the course of influenza once it has developed in an individual. Strain-specific influenza vaccine can be expected to prevent a significant number of cases if administered at least two weeks prior to exposure. Alleviation of the symptoms of influenza can be achieved by the use of antipyretics and other forms of supportive treatment. Antibiotics have no place in the treatment of the usual uncomplicated case, because they have no demonstrable effect on the virus. In a relatively small number of cases, a bacterial pneumonia may develop. When pneumonia is suspected, immediate and vigorous treatment with appropriate antibiotics for the causative organism is, of course, essential.

SMELL OF BLOOD

To the Editor:—*A 50-year-old man says he can smell the odor of fresh blood when he passes a stool that has a few small flecks of bright red blood on it. Can you attach any significance to this? The patient has an anxiety neurosis.*
M. C. Florine, M.D., Janesville, Minn.

Answer.—Perhaps what the patient is smelling is actually occult blood. There is a distinct odor associated with occult blood if present in sufficient quantity. However, it is doubtful whether a few small flecks of fresh blood could be detected by smell. A neurotic, anxious person would be more apt to be concerned about the odor of his stool than would the average person. Although it is possible the matter is entirely functional (psychosomatic), a chemical test for occult blood after a three-day meat-free diet is indicated.

RELEASE OF PART OF HOSPITAL RECORD

To the Editor:—*If a patient presents a signed request to take a roentgenogram to another doctor, osteopath, or chiropractor for interpretation, is the hospital and/or the attending doctor compelled to release such film?*
T. J. Kern, M.D., Hartford, Wis.

Answer.—Hospital records (roentgenograms taken of a patient in the hospital are generally considered to be a part of the hospital record) are the property of the hospital. Unless the jurisdiction in which the hospital is located has statute or court decision stating otherwise, the hospital may, therefore, make, retain, or destroy its hospital records. Most hospitals, however, realizing the value of the records, do make regulations concerning their use, and they often permit x-rays, for example, to be sent to such doctors as the patient may designate for interpretation. On the other hand, however, it is not obligatory for the hospital to adopt regulations. If they have not done so, the patient has no right to demand that a part of the record be sent out of the hospital nor is the hospital under any obligation to honor such a request from a patient. The specific answer to the question, therefore, depends on whether or not the hospital has adopted any rules or regulations relating to the use of its hospital records by other than the attending physician.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Hill-Burton Extension Without Amendments Is Proposed . .

Free Choice of Doctor an Issue at Longshoremen Hearings . .

Five Poliomyelitis Vaccine Makers Named on Antitrust Indictment . .

U. S. Loan Guarantee Program Proposed for Nursing Homes . .

SIMPLE, TWO-YEAR EXTENSION OF HILL-BURTON PROGRAM A POSSIBILITY

After the House Interstate and Foreign Commerce Committee conducted four days of hearings on extension and possible amendment of the Hill-Burton hospital construction program, Chairman John Bell Williams (D., Miss.) indicated that a simple two-year extension of the operation might be recommended, with an effort made later to work out amendments.

Because the act is scheduled to expire June 30, 1959, an extension is regarded as important this year so that there will be no interruption in orderly planning for new hospitals.

The House subcommittee is faced with at least a score of proposed amendments offered by the American Medical Association and American Hospital Association (see last week's issue); the Department of Health, Education, and Welfare; and a number of individual witnesses.

Among the latter were Chairman Oren Harris of the full committee, who urged support for his bill that provides long-term, low-interest loans for hospital construction; Representative Coffin (D.Me.), who urged construction grants of up to $25,000 for rural clinics; and Drs. Daniel Hanley, executive secretary of the Maine Medical Society, and Leon R. Lezer of the Medical College of Vermont, who asked that the law be changed to permit such grants for communities of under 10,000 population, provided the clinics have a contractural relationship with a teaching hospital. Under present law a clinic is eligible only if it is run by a nonprofit organization that also owns and operates a hospital.

For the Department of Health, Education, and Welfare, Deputy Surgeon General John D. Porterfield gave the legislative history of the Hill-Burton program and its accomplishments, and acting HEW secretary Elliot Richardson listed a number of recommendations, including the following: that greatest emphasis be toward "our increasing requirements for long-term care facilities which provide care at minimum cost"; a three-year extension with no changes in the authorized amount for project grants but 5 million dollars rather than $1,500,000 annually for research and demonstration; consolidation of the chronic disease hospital and nursing home categories into a single "long-term care" category, giving the new category 40 million dollars annually or 10 million dollars more than the two separate categories now receive; recover the 10 million dollars by reducing by that amount the appropriation for diagnostic-treatment facilities "for which there have been fewer project applications to date"; delete the present requirement that the sponsor of a diagnostic-treatment center be either a public agency or a nonprofit agency "that owns and operates a hospital"; allow a rehabilitation center to furnish psychological, social, or vocational evaluation services in addition to medical (now it must furnish all four services); permit a state of shift money from its "general hospital" fund to the other categories; permit states to pool hospital funds for construction of an institution for use of more than one state; and authorize states to use up to 4% of construction allotments for advance planning in order to hurry construction of high-priority projects.

FREE CHOICE OF DOCTOR PROPOSED FOR LONGSHOREMEN

A House education and labor subcommittee has been considering legislation to change the longshoremen's and harbor workers' compensation act to, among other things, make clear that there will be free choice of physician. At the present time an injured worker is treated by doctors selected by employers, except in an emergency or where the employer refuses medical care, delays furnishing care, or grants freedom of choice.

The International Longshoremen's Association and the International Longshoremen's and Warehousemen's Union spoke in support of the free-choice preposal in H.R. 7303. The labor department and AFL-CIO witnesses also stressed the need for enactment of a more effective safety code for the industry which is provided in other measures before the subcommittee.

Rep. Albert Bosch (R., N.Y.), after a witness was critical of medical care given under the present law, observed that the witness was talking about a few "quacks." The answer, in his view, was to go after the quacks rather than malign the profession.

FIVE POLIOMYELITIS-VACCINE MAKERS INDICTED UNDER ANTITRUST ACT

Five pharmaceutical manufacturing companies are under indictment on charges of violating the Sherman antitrust act in the sale of Salk poliomyelitis vaccine. The period covered extends from April, 1955, when the vaccine was first pronounced successful and released, up to the present.

Named as defendants are Eli Lilly & Company, Indianapolis; Allied Laboratories, Inc., Kansas City, Mo.; American Home Products Corp., New York City; Merck & Co., Inc., Rahway, N. J.; and Parke, Davis & Co., Detroit.

The indictment charges that the defendants, sole producers of the vaccine in the United States during the three years, conspired to fix prices and eliminate competition on sales to federal, state, and local government bodies.

Between April, 1955, and Dec. 31, 1957, the industry shipped in excess of 205 million cc. of vaccine, with a value of about 125 million dollars, of which approximately 103,500,000 units were sold to public authorities. The bulk of the public sales were made under a 1955 federal law that allocated $53,600,000 to states for purchase of vaccine to be used in public programs and to help meet administrative expenses.

Commenting on the indictments, Assistant Attorney General Victor R. Hansen, in charge of the justice department's antitrust division, said:

"A substantial victory over the disease of polio was won when the success of Salk vaccine was announced in 1955. In the distribution and sale of this vaccine, which is so vital to safeguard the health of the nation, we must be ever alert to insure that there is no collusion among producers to raise or maintain prices at artificial levels.

"The indictment returned today charges that vaccine producers have combined to submit uniform bids to public agencies, to adopt noncompetitive terms and conditions of sale, and to establish uniform pricing methods. Price fixing activities involving such a significant industry and such substantial sales require criminal action by the department."

After the indictments were returned by a federal grand jury in Trenton, N. J., spokesmen for the companies either denied the charges or said they would not comment until they had studied them. President John T. O'Connor of Merck & Co. said his firm came into the production field late and only at the urgent request of the National Foundation for Infantile Paralysis. He explained that Merck & Co. could have charged more than the going price but instead took the "only reasonable alternative" and accepted the going price.

NURSING HOME ASSOCIATION ASKS ENACTMENT OF LOAN PROGRAM

Representatives of the American Nursing Home Association, which represents about 5,000 institutions, almost all of them proprietary, has asked Congress to set up a program of mortgage guarantees under the Federal Housing Administration.

George T. Mustin, past-president of the association, testified before the Senate banking and currency's subcommittee on housing. He said that 91% of the nursing homes are privately owned and that 71% of the beds available for the aged and chronically ill are in these homes.

Mr. Mustin complained that, because of the one-purpose nature of nursing home structures, usual lending institutions generally cannot or will not grant credit on reasonable terms. He made these additional points:

1. "There is no expectation whatever" that public or nonprofit institutions are prepared to take over the responsibility for the aged.
2. The nursing home is a small, private, taxpaying business "that is providing a vital service to the community and is a part of the economy on which America's growth and prosperity is based."
3. The nursing homes are not asking for federal subsidies; they will pay the going rate of interest and will repay the loans "so the money can be used over and over again."
4. The nursing home with realistic standards and with proper arrangements for nursing and physicians' services "serves hundreds of thousands of elderly patients who otherwise would be forced to enter general hospitals and pay the relatively high prices that hospitals are forced to charge."

NEW SECRETARY OF HEW REGARDED AS "LIBERAL REPUBLICAN"

Arthur S. Flemming, now president of Ohio Wesleyan University, who will take over in early summer as Secretary of Health, Education, and Welfare, has been in or close to the federal government for about 20 years and is regarded in Washington as a liberal Republican. His federal jobs have been progressively more important and his appointment to head HEW is not considered surprising as he was talked of as Secretary of Agriculture early in the first Eisenhower administration.

Mr. Flemming, who came to Washington as a Ohio Wesleyan graduate in the late 1920s, was appointed to the Civil Service Commission, as a Republican member of the commission, by President Roosevelt. President Truman subsequently renamed him to the commission. He served nine years on the commission and left to assume the presidency of the college. Mr. Flemming returned to the Washington scene during the Korean War as a manpower expert and again under President Eisenhower, serving with Milton Eisenhower and Nelson Rockefeller on a committee on reorganization of government. From 1953 to 1957 he was head of the Office of Defense Mobilization and then returned to Ohio. He has been a strong advocate of improving the status of top-level jobs in government and early urged an increase in pay to retain good men.

President Eisenhower announced Mr. Folsom's resignation, saying that his devoted leadership made it most difficult for him to accept his decision.

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 167, NO. 4

CHICAGO, ILLINOIS

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MAY 24, 1958

STUDY OF NARCOTICS AND SEDATIVES FOR USE IN PREANESTHETIC MEDICATION

James E. Eckenhoff, M.D.
and
Martin Helrich, M.D., Philadelphia

The use of preanesthetic medication is primarily to produce sedation, but the degree of sedation desirable prior to anesthesia and operation is debatable. Narcotics, while unequaled as analgesics, have many undesirable side-effects. The routine use of narcotics for preoperative medication, therefore, exposes all patients to the hazards of these drugs. There was little difference in the influence of the various preanesthetic drugs on satisfactory induction of anesthesia with any given anesthetic agent, but the complications of the induction period varied according to the preanesthetic drug and the anesthetic agent. The continued routine use of narcotics for preanesthetic medication is unwise and unwarranted. Preoperative medication should be tailored to meet the needs of the patient and his operation.

THE USE OF narcotic and sedative drugs for preanesthetic medication has been the subject of considerable discussion. The proponents of large doses of these drugs vie with advocates of minimal use of depressants. Multiple agents are recommended by some, whereas a single sedative is preferred by others. There have been few factual analyses of the problem with the exception of the report by Cohen and Beecher.[1] The present study was undertaken in order to (*a*) compare the effectiveness of three commonly used narcotics, secobarbital, and a placebo for preanesthetic sedation and (*b*) to determine the incidence of side-reaction to each of these agents and to observe the effect of the drugs upon the conduct of and recovery from anesthesia.

Method

Solutions of the drugs to be tested were dispensed in identical bottles. These were coded and labeled by one individual. An attempt was made to prepare equipotent doses of the drugs. Each milliliter of solution contained morphine, 5 mg.; meperidine (Demerol), 50 mg.; alphaprodine (Nisentil), 30 mg.; secobarbital (Seconal), 75 mg.; or saline solution. The anesthetist or surgical resident ordered the medicament as "blind medication X-ml." If he would normally have ordered 10 mg. of morphine or 100 mg. of meperidine, he would prescribe 2 ml. of the blind medicament. If 5 mg. or 50 mg., he would prescribe 1 ml. The number

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From the Department of Anesthesiology, University of Pennsylvania School of Medicine.

of milliliters selected was based upon clinical judgment. Intramuscular injections were ordered. Neither the person writing for or administering the medicament, the anesthetist, nor the persons compiling the data were aware of the contents of any bottle until after tabulation was complete at the end of the study. All medicaments were given in combination with atropine sulfate.

Blind medication was used in 1,761 patients. This analysis deals with the data recorded from 1,400 patients. The remainder were excluded for the following reasons: scopolamine was used in place of atropine, additional barbiturates were given with the blind medicament, the time interval between injection of medicament and induction of anesthesia was too short (30 minutes or less) or too long (2 hours or more), or the patient was operated on under local anesthesia administered by a surgeon and was not attended by a physician anesthetist.

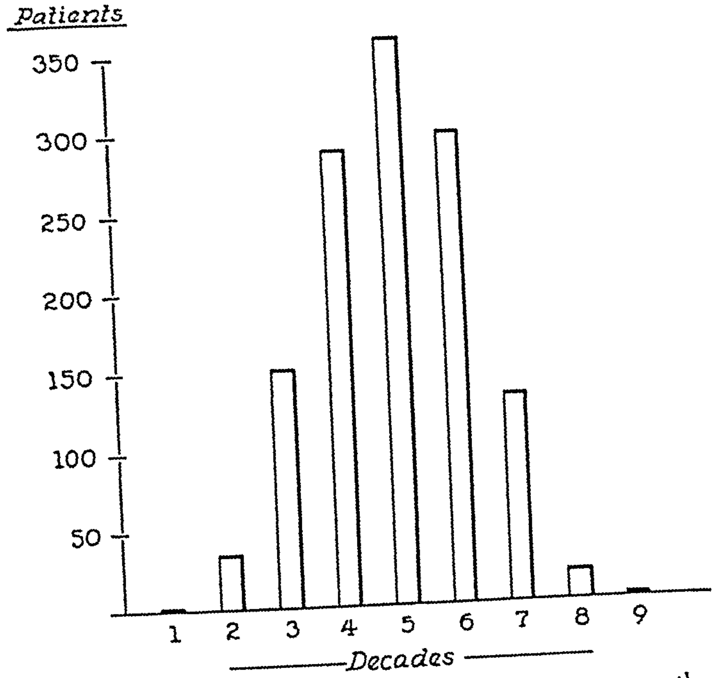

Fig. 1.—Age distribution of 1,400 patients in preanesthetic medication study.

In the anesthesia room, study sheets were completed by the anesthetist. Vital signs obtained on the ward prior to operation were recorded as well as those obtained just before induction of anesthesia. The preanesthetic condition of the patient was determined according to the following criteria: alert, apprehensive, drowsy, sleeping but easily rousable, and carefree. More than one description could be indicated, but, obviously, alert and drowsy could not be checked simultaneously, nor could apprehensive and carefree. One patient could, however, be alert and carefree, or drowsy and apprehensive. Side-effects such as nausea or vomiting, respiratory depression, dizziness, hypotension, and tachycardia were recorded depending upon the clinical judgment of the anesthetist as he appraised the patient in the operating room.

Approximately 90% of the patients included in the study were observed the night prior to operation by the anesthetist who was to administer the anesthetic. Eighty-two per cent of the patients were service patients, and the remainder semi-private or private. Seventy-five per cent were women. The age distribution is indicated in figure 1.

Table 1.—*Quantity of Medication Administered According to Patient's Age*

		% of Patients	
Dose, Ml.	% of Entire Study	Aged 60-65	Over 67
0.5............	0	0	2
1.0............	11	38	53
1.5............	36	34	23
2.0............	53	28	22

Fifty-three per cent of the patients received 2 ml. of the blind medicament; 36%, 1.5 ml.; and 11%, 1.0 ml. of solution. Table 1 indicates that reasonable clinical judgment was exercised in determining dosage at least on an age basis. However, fewer patients received 2-ml. doses of morphine and alphaprodine as compared to the other three groups (table 2).

Immediate Preanesthetic Period

Mental Status.—The effectiveness of the four drugs and placebo as preanesthetic sedatives on the mental status of the patients is listed in table 3. Of interest is the fact that, when patients were not given sedatives or narcotics, only 36% appeared apprehensive upon arriving in the operating room. Secobarbital reduced this incidence to 21%, which was statistically significant as determined by the chi square test ($p<0.01$). The three narcotics also reduced the number of patients who were apprehensive, but the change was not statistically significant. In this study, therefore, secobarbital proved superior to narcotics in relieving preoperative apprehension. A carefree attitude or one of indifference to the impending operation might be considered as the counterpart of apprehension. Nine per cent of patients to whom a placebo had been administered demonstrated this attitude. Narcotics did not increase the incidence, wherea secobarbital caused indifference in 21% of patient This was a highly significant change ($p<0.01$).

Table 2.—*Quantity of Medication Administered According to Drug**

Dose, Ml.	Saline Solution	Secobarbital	Morphine	Meperidine	Alphaprodine
1.0............	8	10	10	11	15
1.5............	31	31	45	33	41
2.0............	61	59	45	56	44

* Figures expressed as percentages, except dose

Sedation.—Since sedation is one of the princip reasons for giving preanesthetic drugs, we hav analyzed the effectiveness of the drugs in producing a state of drowsiness or in causing the patient to sleep (table 3). Nearly 21% of the patients to whom a placebo was given either appeared to be drowsy or were observed to be asleep. Both secobarbital and the narcotics increased this incidence significantly (p<0.01). The narcotics as a group were significantly superior (p<0.01) to secobarbital in this regard. Of interest, however, is the fact that many patients to whom narcotics had been given and who appeared drowsy were obviously apprehensive nonetheless.

TABLE 3.—*Preanesthetic Mental Status and Sedation**

	Saline Solution	Secobarbital	Morphine	Meperidine	Alphaprodine
No. of patients....	320	192	303	282	303
Apprehensive	36	21	29.5	30.5	33
Carefree.. .	9	21	9.5	11.5	8
Alert.........	66.5	62	50.5	43	40
Drowsy......	19.5	35	37	42	45
Sleeping.....	1.4	4	5.5	8.5	7

*Figures expressed in percentages, except number of patients

Effect on Blood Pressure, Pulse Rate, and Respiratory Rate.—The influence of the four drugs and the saline solution on blood pressure, pulse rate, and respiratory rate was determined by comparing data obtained on the ward with those recorded in the anesthesia room (table 4). There was no significant difference between the drugs so far as effect upon blood pressure was concerned. However, the narcotics led to an increase in pulse rate more often than did the saline solution or secobarbital (p<0.01). This was especially notable when meperidine had been given for premedication. Forty-five per cent of the patients receiving this narcotic had an increase in pulse rate. Because of their well-documented respiratory depressant effect, one might suspect that the narcotics would have a more pronounced influence upon respiratory rate. This was substantiated. Although a lowered respiratory rate was observed less often with saline solution as compared with narcotic, the difference was not significant, but that between narcotic and secobarbital was highly significant (p<0.01).

TABLE 4.—*Influence of Preanesthetic Medication upon Blood Pressure, Pulse Rate, and Respiratory Rate**

Blood pressure	Saline Solution	Secobarbital	Morphine	Meperidine	Alphaprodine
Unchanged	60	62	55	54	57
Increased	20	17	24	28	25
Decreased	20	21	21	17	18
Pulse rate					
Unchanged	48	54	39	39	47
Increased	31	27	35	45	38
Decreased	21	19	26	16	15
Respiratory rate					
Unchanged	64	67	57	57	54
Increased	13	16	13	13	14
Decreased	23	17	30	29	31

* Figures expressed as percentages. Increase or decrease = 10% or greater change from data observed on ward.

Since a 10% change in blood pressure, pulse rate, or respiratory rate may not be meaningful in all cases, an attempt was made to designate those situations in which the changes were of sufficient degree to cause concern to the anesthetist. For instance, concern might be expressed if the pulse rate was increased to 120 per minute; or if the tidal and minute volume of respiration was obviously below normal. The incidence of such occurrences, along with nausea and vomiting and dizziness, is listed in table 5. It is apparent that narcotics led to more problems than did saline solution or secobarbital. The difference in incidence of these sequelae is highly significant (p<0.01). It is of interest that nalorphine was required to combat respiratory depression in five patients, one of whom subsequently was shown to have received meperidine, another morphine, and three alphaprodine. When the nalorphine was given, the anesthetist did not know the patient had been given a narcotic, but all five patients responded promptly with an increase in respiratory rate and minute volume.

It was necessary to cancel the operation for two patients, one of whom had been given morphine and developed marked hypotension; the other had been given meperidine and was noted to have a persistent tachycardia of 140 and above. Both patients were rescheduled, at which time atropine alone was given for preanesthetic medication, and in both patients the administration of the anesthesia and the operation proceeded without incident. There were no cancellations of operation for patients receiving saline solution or secobarbital.

TABLE 5.—*Undesirable Side-effects of Preanesthetic Medication**

	Saline Solution	Secobarbital	Morphine	Meperidine	Alphaprodine
None	88	91	81	70	73
Respiratory depression	4.5	5.2	10†	18†	19†
Hypotension	2.3	2.0	2.3‡	2.1	3
Tachycardia	2.3	0.5	4	4‡	2
Dizziness	3	5	8	11	10
Nausea and or vomiting	3	1.5	2.3	6.3	2.7

* Figures expressed as percentages.
† Nalorphine required in one case with morphine, one with meperidine, and three with alphaprodine.
‡ Operation canceled for one patient.

Side-effects.—Dizziness was a common side-effect of preanesthetic medication. Patients complained of this even though lying supine on a litter, but most often the complaint came with the movement from litter to operating table. Three per cent of the patients to whom saline solution had been given spoke of dizziness, whereas 5% of those given secobarbital experienced the sensation (table 5). Morphine led to dizziness in 8%, meperidine in 11%, and alphaprodine in 10%. The difference between the narcotics and saline solution was highly significant statistically (p<0.01). Nausea and vomiting prior to anesthetization is a well-documented side-effect of narcotics, the incidence of which is related among other things to body position and motion.[2] In this study, wherein patients remained for the most part in the supine position, there was no significant difference between saline solution and the other drugs. However, the incidence after meperidine was four times higher than that after secobarbital (table 5).

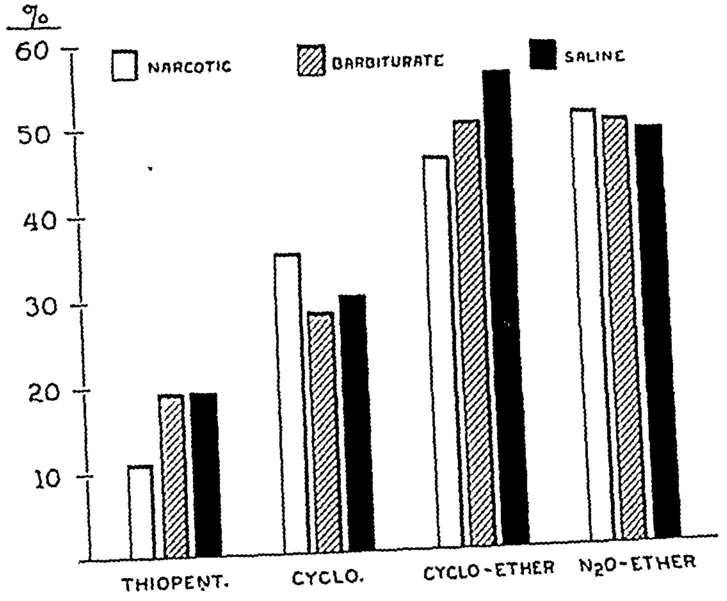

Fig. 2.—Unsatisfactory inductions to anesthesia.

Course of General Anesthesia

In an effort to obtain information on the influence of preanesthetic drugs upon the course of general anesthesia, the anesthetic records of the patients in this study were analyzed as follows:

Induction.—Anesthesia was induced by either thiopental, nitrous oxide, or cyclopropane in the majority of the patients. When thiopental was given, it was usually followed by the inhalation of nitrous oxide or, less commonly, by cyclopropane. Six hundred of the 932 patients under general anesthesia summarized in figure 2 were without the use of thiopental for induction. On the basis of the incidence of satisfactory induction of anesthesia, it is apparent that the individual preanesthetic drug used made little difference. In this clinic, a satisfactory induction to general anesthesia is one without coughing, vomiting, struggling, laryngospasm, excessive respiratory tract secretions, or unintentional apnea.

Preanesthetic medication did, however, influence the type of complication encountered during the induction of anesthesia (fig. 3). If thiopental was injected to induce anesthesia and secobarbital was the preanesthetic sedative, coughing and laryngospasm were the common complications. When the placebo had been given, unusually large amounts of thiopental were required for induction. When anesthesia was induced with cyclopropane, the incidence of unsatisfactory inductions was higher than with thiopental. Where narcotics had been given for preanesthetic medication, excitement and unintentional apnea were more common than when secobarbital or a placebo had been used. The principal problems occurring with cyclopropane after secobarbital sedation were coughing, laryngospasm, and respiratory obstruction. The addition of ether to cyclopropane increased the incidence of complications. Coughing and excessive respiratory tract secretions were common after secobarbital premedication, whereas unintentional apnea appeared frequently after narcotics had been given When the nitrous oxide–ether sequence was used, little difference was noted in the incidence of induction complications after secobarbital, placebo, or narcotic, except that slowness of induction was often observed after secobarbital. Apnea was notably uncommon after any medication with this sequence.

Maintenance.—Analysis of the influence of preanesthetic medication upon anesthetic complications occurring during maintenance of general o spinal anesthesia proved to be difficult because o the large number of factors involved. Attempt were made to analyze the effect of medication upo the incidence of hypotension, hypertension, brady cardia, tachycardia, respiratory depression, tachyp nea, coughing and laryngospasm, excessive secre tions, and excessive anesthetic agent. No significa difference could be detected when patients recei ing narcotics were compared with those give barbiturates in any of these functions except th respiratory depression was noted three times mo often with the narcotics. When trifluoroethyl ether (Fluoromar) was the principal anest agent, tachypnea was common if barbiturates given and less common if narcotics had bee ministered.[3]

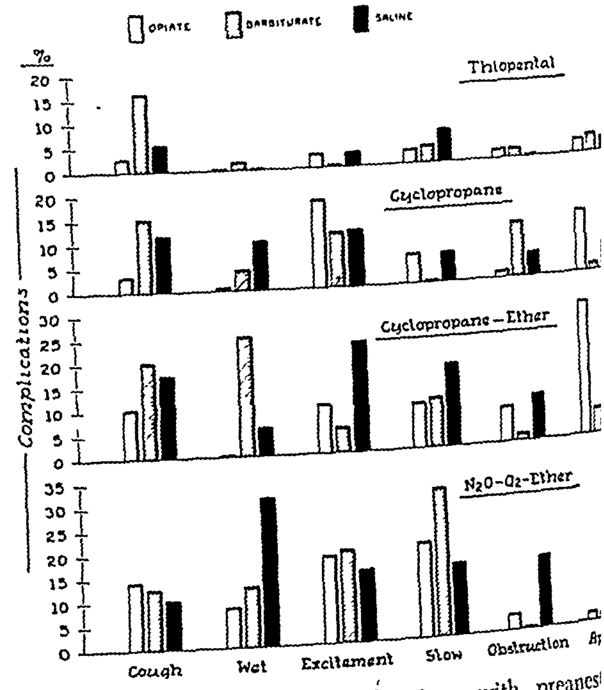

Fig. 3—Incidence of complications with preanes medication during induction to anesthesia.

Recovery.—A comparison of the recovery phase of anesthesia in patients receiving the various preanesthetic drugs was also difficult because of the number of variables. No apparent difference was seen in the incidence of immediate postoperative vomiting or hypotension. However, obvious differences could be discerned in the rapidity of recovery from general anesthesia, in the incidence of postoperative restlessness and excitement, and in complaints of pain in the recovery room.

Rapidity of recovery according to the preanesthetic drugs is recorded in figure 4. This was determined by clinical examination. If a patient was awake upon arrival in the recovery room, his awakening was judged to be rapid. If he was still asleep one hour after arriving there, his recovery was considered prolonged. It is apparent that patients receiving narcotics slept longer than those given secobarbital or saline solution.

Emergence restlessness or excitement was recorded if the patient tossed and turned on his litter or bed, was restless or behaved in a disoriented fashion, or required unusual restraint to prevent falling from the litter. Complaints of pain were not considered restlessness. Figure 5 depicts the incidence of restlessness and excitement according to the anesthetic agents and preanesthetic medication. It is evident that the incidence was highest with saline solution or barbiturate for each of the anesthetics or combination of anesthetics.

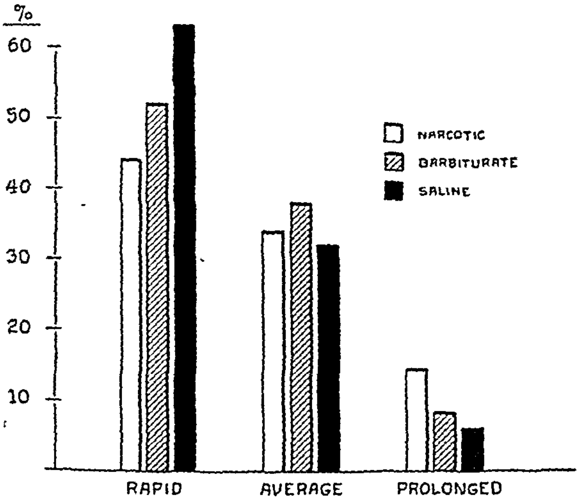

Fig. 4—Rapidity of recovery from general anesthesia according to preanesthetic medication.

Fewer patients complained of pain in the recovery room when they had received narcotics for anesthetic medication (14%) than did those given barbiturate (19%) or saline solution (20%). It is interesting that when saline solution had been given only one in five patients complained of immediate postoperative pain. An analysis of the duration of operation in these patients revealed that those who had opiates and complained of pain had operations averaging three hours, those with saline solution averaged three hours and six minutes, and those with barbiturate averaged two hours and three minutes.

Recognition by Anesthetist of Type of Preanesthetic Medication Given.—Cohen and Beecher[1] reported that anesthetists were unable to determine by observation what preanesthetic drugs had been given. We have likewise asked anesthetists to indicate their guess as to the nature of the medicament given. The results are in table 6. In this study, the anesthetists' guesses were reasonably accurate, except when secobarbital had been given.

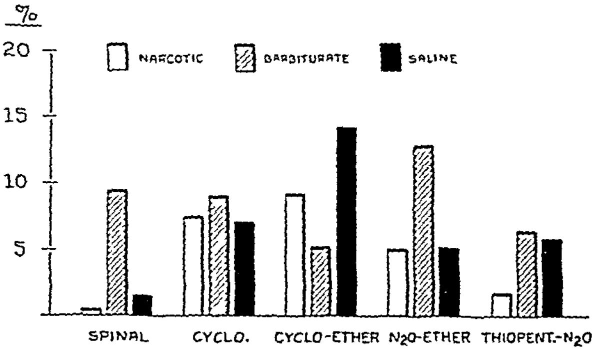

Fig. 5—Incidence of excitement on emergence according to anesthetic agents and preanesthetic medication.

Comment

In the early days of anesthesia the induction of anesthesia with ether or with chloroform in a healthy, robust individual was often a harrowing experience to patient and his anesthetist as well. Concern was expressed frequently over prolonged excitement and the large amounts of anesthetic required to keep patients asleep for long operations. The first recorded uses of morphine to supplement general anesthetics appeared as a solution to these problems.[4]

Today the use of preanesthetic medication is primarily to produce sedation.[4A] Preanesthetic narcotics may be given to relieve pain, but most patients scheduled for operation are not in pain. The degree of sedation desirable prior to anesthesia and operation is debatable. Many believe an ideal state to exist when the patient is sleeping but rousable, and when there is retrograde amnesia for the anesthetic and operative experience. If this state could be produced without harm to the pa-

TABLE 6.—*Anesthetist's Guess as to Preanesthetic Medicament*[*]

	Saline Solution	Secobarbital	Morphine	Meperidine	Alphaprodine
Narcotic .	19	29	63	83	67
Nonopiate .	19	32	19	15	18
Placebo ..	62	39	18	2	15

[*] Percentage of guesses correct

tient, there would be little ground for argument. If the hazard is significant, search must be made for drugs with less drawbacks. Lacking such agents, a compromise must be made in the desirable preoperative condition of the patient.

There can be no question that the narcotics are unequaled as analgesics. There is likewise agreement that the narcotics have many undesirable side-effects.[5] The data presented show that the incidence of undesirable side-reactions to the narcotics studied are considerable and are greater than those observed after secobarbital. They also demonstrate the superiority of narcotics over secobarbital in producing drowsiness or sleep in pain-free patients. However, this was associated with a higher incidence of apprehension and concern for the approaching operation than noted with the barbiturate. Of especial note is the fact that without sedatives or narcotics, 64% of patients evinced no preoperative apprehension. Secobarbital raised this to 79%. The routine use of narcotics for preoperative medication, therefore, exposes all patients to the hazards of these drugs in an attempt to obtain sedation in 20% of surgical patients.

Do preanesthetic narcotics reduce the incidence of excitement during induction of anesthesia? Cohen and Beecher [1] concluded that "when utilizing a given anesthetic agent, there is little difference in response to the various drugs used for preanesthetic medication. The patient's response to the various anesthetic agents, however, did vary." Our experience supports this view (fig. 2 and 3). It may be of significance that, when narcotics were administered preoperatively, respiratory tract secretions were a minor problem with all combinations of anesthetic agents during induction, whereas excessive secretions were a common complication with saline solution or secobarbital. It would appear that the dose of belladonna should be increased if it is to be given alone or in combination with a barbiturate.

How does one reconcile the fact that preanesthetic narcotics were apparently originally used to diminish the incidence and severity of excitement during induction of anesthesia and that neither Cohen and Beecher nor ourselves have been able to substantiate this? Preanesthetic medication was introduced at the time when chloroform and ether were the only commonly used anesthetic agents. The nitrous oxide–ether sequence had not been described. Both chloroform and ether have a high air:blood partition coefficient. Therefore, they must be present in high concentration for surgical anesthesia. As this level is slowly developed, a prolonged excitement stage is encountered. Morphine minimized excitement by producing sedation and apparently by augmenting the anesthetic. The hazard of narcotic plus anesthetic appeared less than that of a prolonged stormy induction and high anesthetic concentration. Today, however, intravenously administered barbiturates usually permit rapid and pleasant induction, and general anesthetic agents are available which have a low partition coefficient, and therefore a shorter induction period. When diethyl ether is to be used, induction of anesthesia is possible with nitrous oxide, ethylene, cyclopropane, vinyl ether, or ethyl chloride. Because of the rapidity of action of these agents, the need for additional depressants has been minimized. If our studies had been conducted upon patients to whom ether or chloroform was to be given for induction as well as maintenance, our results might have been different.

We did not obtain data in this study as to whether or not narcotics decrease the concentration of anesthetic needed to maintain a given plane of anesthesia. In another study,[6] we have advanced evidence to suggest that inhalant anesthetics may alter cell permeability or cell response, so that the effect of a given blood-stream concentration of nonvolatile central nervous system depressant is intensified. The observation that apnea occurred frequently when narcotics were given prior to cyclopropane or cyclopropane–ether anesthesia supports this thesis. If narcotics allowed for a lesser concentration of anesthetic, one would still have to balance the advantage of a slightly diminished concentration of inhalant anesthetic versus the hazards of the opiate. It is of interest to note that, in 1890, Horatio Wood [7] expressed an opinion on this subject when he wrote

> A-priori reasoning would render it probable that anesthesia would be more easily produced and would be more prolonged in the semi-narcotized patient than in the normal individual, and clinical experience has confirmed this. But in the prolongation of anesthesia would seem to lurk a danger. Certainly, it is but natural to suppose that an anesthetic accident occurring in a person who is under the influence not only of a volatile and easily dissipated poison, but also of a nonvolatile and comparatively permanent poison would be far more serious than if the failure of respiration and of circulation were the outcome of an agent which could rapidly be removed. Several surgeons have shown that this reasoning is not devoid of practical support and a number of cases have been published in which very serious symptoms, or even death, have occurred during the mixed narcotism.

In view of the line of reasoning taken by Wood, secobarbital offers a certain advantage over the narcotics in its brevity of action. Narcotics continue to exert an influence for many hours,[5] whereas the barbiturate injected intramuscularly dissipates its effect in about two hours. This is an advantage should difficulty arise.

Patients who have had narcotics take longer to recover from anesthesia (fig. 4), an observation that agrees with those of early investigators.[4b] There are advantages of early awakening, such as more rapid return of protective reflexes with less hazard of respiratory obstruction or aspiration of vomitus and the need for less close postanesthetic supervision. These are important considerations in the absence of recovery rooms or where nursing personnel is at a premium. There are also disadvantages to rapid awakening, such as the earlier perception of pain and greater discomfort for the patient in the immediate postanesthetic period (fig. 5). Restlessness and complaints of pain were more common in patients given barbiturates or saline solution.[8] However, only one patient in five who received saline solution complained of pain in the recovery room, whereas one of seven who had had narcotic complained of pain.

What are some of the criteria by which an anesthetist chooses preanesthetic sedatives or narcotics? One of the more obvious is the age and physical status of the patient. Elderly, sedentary, and chronically or acutely ill patients should receive narcotics uncommonly. One need be less concerned about the healthy and robust because of their wide margin of tolerance. Excitable, nervous, and apprehensive patients require more sedation than do those who are calm and philosophical. In this regard, the anesthetist should never underestimate the value of the preanesthetic visit and discussion with the patient. The establishment of rapport and confidence will do more to allay fears and produce calmness than any amount of narcotics or barbiturates, and it is far safer for the patient.

A second criterion is the anesthetic technique the anesthetist will use. If potent general anesthetics such as cyclopropane or ether are contemplated, narcotics are not necessary. If a less potent combination such as an intravenously administered barbiturate and nitrous oxide is planned, narcotics are also unnecessary if the proposed operation will not be associated with great pain, nor relaxation be needed. However, in extensive operations associated with considerable dissection and need for relaxation, narcotics will probably be needed.

Surgeons often unwittingly commit the anesthetist to drugs and procedures that are not in the best interest of the patient. Thus promises are made that a patient will be oblivious of his trip to the operating room or that he will have no pain postoperatively. A surgeon may insist unnecessarily upon the use of the electrocautery during an operation. The latter forces the anesthetist to use a nonexplosive technique usually calling for increased narcotic preanesthetic medication or supplementation of a thiopental–nitrous oxide relaxant anesthesia with narcotics given intravenously. The dangers of this combination in certain patients may outweigh any possible advantages of reduced blood loss or operating time.

Each patient must be considered individually and each anesthetic and operation must be viewed objectively. Preoperative medication should be tailored to meet the needs of the patient and his operation. With the anesthetic agents and techniques available today, there is no place for "routine preanesthetic medication." Our continued study of this problem has led us to believe that the optimum condition of patients brought to the operating room is awake and alert, yet free of apprehension. It is safest this way. The data presented suggest that the continued routine use of narcotics for preanesthetic medication is unwise and unwarranted. We do not advocate abandoning preanesthetic use of narcotics, but we do believe they should only be ordered with a specific objective in mind and with an awareness of the hazards inherent in their use.

Summary

Data obtained in a blind study of morphine, meperidine, alphaprodine, secobarbital, and saline solution as preanesthetic medicaments in 1,400 surgical patients showed that secobarbital led to a higher proportion of calm, carefree, yet alert patients than did the narcotics. The latter drugs produced more drowsy or sleeping patients but also a higher incidence of apprehension than did secobarbital. Undesirable side-effects were seen more often after preanesthetic narcotics than with secobarbital. There was little difference in the influence of the various preanesthetic drugs upon satisfactory induction of anesthesia with any given anesthetic agent. However, the complications of the induction period did vary according to the preanesthetic drug and the anesthetic agent.

Preanesthetic drugs did not appear to influence the maintenance of anesthesia, except that respiratory depression was more common if a preanesthetic narcotic had been given. When narcotics had been given preoperatively, the patient remained narcotized longer after anesthesia than did those who received secobarbital or saline solution, but they did not complain of pain as often nor appear as restless as did the latter groups. These data are significant in the clinical practice of anesthesia.

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The alphaprodine used in this study was supplied as Nisentil by Hoffman-La Roche, Inc., Nutley, N. J., who also supplied the morphine. The secobarbital was supplied as Seconal by Eli Lilly & Company, Indianapolis.

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SIGNIFICANCE OF FATAL PULMONARY EMBOLISM IN IMMEDIATE POSTOPERATIVE PERIOD

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Factors that might predispose a patient to fatal postoperative pulmonary embolism were sought in a study of 943 autopsy records representing 10 years of hospital experience. Pulmonary embolism was demonstrated in 118 cases and considered to be the primary cause of death in 49. In 22 cases fatal pulmonary embolism followed a major operation. Four of these 22 deaths occurred during the first 24-hour period after surgery. Fever and tachycardia were present preoperatively in five of six patients who died within the first 72 hours after operation. Almost one-half of the postoperative group were limited in physical activity prior to surgery. These findings suggest that an underlying thrombotic process may have been present at the time of operation. Thus, preventive measures routinely employed after surgery would appear to be equally important during the preoperative period.

Fatal pulmonary embolism continues to threaten the convalescence of both medical and surgical patients. Few subjects have prompted more intensive investigation, yet little encouragement is provided by statistical studies, which show a rather constant incidence over the past 50 years.[1] Certainly, progress has been made in the management of thromboembolism, and especially in the treatment of acute phlebitis and its complications. Unfortunately, however, fatal pulmonary embolism frequently originates from an asymptomatic extremity, and its occurrence is the first manifestation of an underlying phlebothrombosis.

Because of the problems encountered in diagnosis of phlebothrombosis and the lack of a satisfactory treatment once massive embolism has occurred, attention is directed toward the prevention of thrombosis. Predisposing factors, including advanced age, limitation of activity, obesity, hypoproteinemia, anemia, dehydration, and the presence of cancer, have been implicated. Although correction of such abnormalities is recognized as extremely important, it is not always obtainable, and to date preventive measures have not eliminated sudden unexpected fatal pulmonary embolism in the postsurgical patient.

The recent occurrence of four cases of fatal pulmonary embolism in the immediate postoperative period stimulated our interest in the problem. Not only did it appear worthwhile to investigate this relatively unusual event and its significance in the entire problem of postoperative thromboembolism, but also it provided an opportunity to review the general subject of pulmonary embolism at Passavant Memorial Hospital for the past 10-year period.

A total of 943 autopsies of adults were performed between July 1, 1947, and June 30, 1957, and pulmonary embolism was demonstrated in 118 instances (12.5%). In 49 patients (5.2%) embolism was considered to be the primary cause of death, and of this group 22 died after an operation. During the same period, 26,688 major surgical procedures were performed; this gives a postoperative

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incidence of 0.082%. The remaining 27 deaths directly attributable to pulmonary embolism occurred either in patients on the medical services or in patients with surgical problems treated by nonoperative measures. In 69 patients the embolism was associated with another, more significant cause of death.

Fatal Postoperative Embolism

In the 22 cases of postoperative fatal pulmonary embolism reviewed, the ages of the patients ranged from 26 to 81, with an average of 55 years. There were 12 females and 10 males. The primary disease, as well as the type of surgical therapy and associated complicating factors, are tabulated in the table. Nine patients died after neurosurgical procedures, six after colon surgery, and three after gynecologic operations. Also, fatal embolism followed a jejunostomy and splenectomy, an esophagogastrectomy, an open reduction of a fracture, and a thyroidectomy. One-half of the patients suffered from some form of cancer. In 15 instances the postoperative course was complicated. Four patients developed postoperative infections and seven were limited in activity as a result of either hemiparesis or a semicomatose or comatose state. A wound disruption, a postoperative abdominal hemorrhage, and a decubitus ulcer accounted for three complications. In the remaining patient, though no specific complication could be defined, the postoperative course was stormy, with recurrent bouts of nausea, vomiting, and weakness, which limited ambulation. Only seven patients appeared to be recovering in a normal manner.

Activity preceding surgery was considered good in only 12 patients. The remainder were limited either because of their illness or the restrictions of hospitalization. Activity after operation was considered adequate when the patient was ambulatory by the third postoperative day; prior to this time, care was taken to encourage deep breathing as well as active and passive exercises of the lower extremities. Only six patients achieved these criteria; the remainder were limited to lesser degrees of activity.

Twelve patients had intravenous infusions during or after operation in one or both lower extremities, and seven developed evidence of phlebitis in the leg used for infusion. Embolism was preceded by phlebitis in a total of 10 patients. It is important to note that in over one-half of the group fatal embolism was the first evidence of thromboembolic disease.

Low-grade elevations in temperature (99 to 100 F [37.2 to 37.8 C]) and pulse (80 to 100 beats per minute) were noted preoperatively in 12 instances. Similar findings were observed in all but one patient after operation. In five of six patients who died within the first 72 hours, low-grade fever and tachycardia were present prior to surgery.

The symptoms and physical findings associated with fatal pulmonary embolism, in order of frequency, were as follows: tachycardia in 22 patients, cyanosis in 16, dyspnea in 14, tachypnea in 9, diaphoresis in 5, hypotension in 5, cough in 2, rales in 2, hemoptysis in 1, and pain in 1. Thus we see that, in addition to the expected tachycardia and either tachypnea or dyspnea, cyanosis was a remarkably frequent finding. Diaphoresis and hypotension were noted less often, while cough, hemoptysis, rales, and pain occurred only occasionally.

Data on Fatal Postoperative Pulmonary Embolism in Twenty-two Patients

Case No.	Primary Disease	Operation	Complications
1	Leiomyoma, esophagus	Esophagectomy with esophago-gastrostomy	Peritonitis, empyema
2	Uterine fibromas	Complete abdominal hysterectomy	None
3	Ruptured ovarian cyst	Salpingo-oophorectomy	Reoperation for intra-abdominal bleeding
4	Recurrent cystourethrocele; functional uterine bleeding	Complete abdominal hysterectomy; repair cysto-urethrocele	None
5	Astrocytoma	Craniotomy	None
6	Carcinoma (sigmoid)	Sigmoid resection, colostomy, distal stump left in situ	Pelvic abscess
7	Carcinoma (esophagus)	Jejunostomy, splenectomy	Wound dehiscence
8	Fracture (patella)	Open reduction, wire fixation (patella)	None
9	Carcinoma (rectosigmoid) with perforation and peritonitis; periappendiceal abscess	Drainage (periappendiceal abscess)	Peritonitis
10	Meningioma	Craniotomy	Coma
11	Glioblastoma multiforme	Craniotomy	Decubitus
12	Trigeminal neuralgia	Trigeminal neurectomy	Coma
13	Perforated sigmoid diverticulitis	Transverse colostomy	Intestinal obstruction, peritonitis
14	Recurrent astrocytoma	Craniotomy	Hemiparesis
15	Glioblastoma multiforme	Craniotomy	Hemiparesis
16	Meningioma	Craniotomy	Coma
17	Carcinoma (ascending colon)	Right hemicolectomy	None
18	Astroblastoma	Craniotomy	Pneumonia, stupor
19	Suspect intracranial tumor	Craniotomy	Hemiparesis, coma
20	Thyroid cyst (substernal)	Thyroidectomy	None
21	Carcinoma (prostate) with widespread disease	Sigmoid colostomy	None
22	Carcinoma (sigmoid)	Abdominoperineal resection	Poor response postoperatively

The time interval between operation and the onset of fatal pulmonary embolism varied from 4½ hours to 60 days. The average time was 19 days. Seven patients developed a fatal embolism before the seventh postoperative day, while 4 embolisms occurred during the second week and 11 in the period that followed.

The exact survival from onset of symptoms until death is difficult to define. Several patients had severe respiratory distress for considerable periods of time prior to death, while others died almost instantaneously. Twelve patients died within the first hour of symptoms. The remainder lived for intervals of 1 hour to 11 days after the initial symptoms attributable to embolism became apparent.

Fatal Pulmonary Embolism in Immediate Postoperative Period

Four patients died as a result of pulmonary embolism in the first 24 hours following a major surgical procedure. This is a relatively infrequent event, though isolated instances have been reported.[2] A brief clinical summary of each case follows.

Report of Cases

Case 1.—An 80-year-old female was hospitalized on June 16, 1956, for evaluation of an episode of rectal bleeding. The remainder of the history was negative, except for pernicious anemia, which was controlled by medical management. Physical examination was unremarkable, except for mild hypertension and the presence of gross blood on rectal examination. Laboratory studies revealed an admission hemoglobin level of 8.8 Gm. per 100 cc., a hematocrit of 28%, and a sedimentation rate of 15 mm. per hour (Wintrobe). A barium enema demonstrated an annular lesion in the ascending colon.

During the 14-day period of hospitalization before operation, daily low-grade elevations of temperature (99.4 to 100 F [37.4 to 37.8 C]) and pulse (80 to 90) were noted, except during the last four days prior to surgery, when the temperature was normal. Her activity was limited during the entire preoperative period.

After adequate preparation a hemicolectomy was performed on June 30, 1956, to remove an adenocarcinoma of the ascending colon. Except for a short period of hypotension which occurred initially, the operative procedure was uneventful. The operation was completed in less than three hours, and in the immediate postoperative period the patient responded well. Three hours after surgery, the blood pressure was 160/90 mm. Hg, the pulse rate was 88, and she was conscious. Five hours after the operation she developed severe diaphoresis and within 15 minutes became dyspneic and cyanotic. Symptomatic treatment was given without benefit, and she died 6 hours and 45 minutes after completion of the procedure.

Autopsy revealed an embolus lodged in the main pulmonary artery and extending into the left branch. The lungs were hyperemic and congested. Due to the size of the embolus the source was believed to be one of the large veins of the lower extremities.

The combination of advanced age and cancer plus the restriction of normal activity imposed by hospitalization were strong predisposing factors for thrombus formation. The preoperative low-grade fever and tachycardia were interpreted as resulting from infection in and around the tumor but may have originated, at least in part, from a low-grade phlebitic process. The hypotension at the time of operation, though of short duration, may have contributed to the formation of a fresh propagating thrombus.

Case 2.—A 65-year-old female was hospitalized on Dec. 16, 1956, for evaluation and treatment of a cervical mass that produced symptoms of pressure in the throat and difficulty in breathing. The patient had also noticed a change in voice during the preceding six months. Physical examination was normal, except for a palpable left cervical mass, which moved on swallowing. Laboratory studies were within normal limits. Roentgenograms of the chest revealed deviation of the trachea to the right and, in addition, an area of increased density in the middle lobe. After appropriate studies and institution of therapy, the patient was discharged. She was readmitted on Dec. 26, 1956, at which time chest x-rays showed disappearance of the middle lobe density. During the preoperative hospital stay, activity was curtailed below normal, and on several occasions a low-grade fever was noted.

On Jan. 3, 1957, bronchoscopy under general anesthesia revealed normal vocal cords and tracheobronchial tree. On completion of bronchoscopy, a left thyroid lobectomy was performed without difficulty. Postoperatively she responded well, and the vital signs were stable. Four hours and 20 minutes after completion of the operation she suddenly died without cyanosis or other respiratory distress preceding.

Autopsy revealed an antemortem clot straddling the bifurcation of the left and right pulmonary arteries. The lungs were edematous and hyperemic. The ovarian veins contained thrombi, and the iliac veins were patent; however, the size and length of the thrombus indicated origination from a large leg vein.

Here, again, an older individual was restricted to a level of activity below normal prior to surgery. The low-grade fever may have originated from the thrombotic process, which eventually proved fatal.

Case 3.—A 66-year-old male was hospitalized on March 10, 1957, in a confused state, with a history of hematuria, fecal incontinence, and melena for a period of one month. Examination at the time of admission revealed abdominal distention, with multiple hard masses in the right upper quadrant, epigastrium, and left lower quadrant. The admission diagnosis was probable carcinoma of the colon, with invasion of the bladder, and abdominal carcinomatosis. Laboratory studies were normal, except for the findings of 15 to 30 white blood cells in the urine and 1+ albuminuria. The hemoglobin level was 14.3 Gm. per 100 cc., hematocrit 44%, and sedimentation rate 19 mm. per hour.

For the week preceding operation there was a low-grade elevation of temperature (99.6 F [37.6 C]) and pulse (80 to 96 beats per minute) each day. Because of the degree of debility and confusion, activity was extremely limited preoperatively.

On March 18, 1957, a colostomy was performed to relieve a colonic obstruction. Exploration revealed abdominal carcinomatosis, which included large masses in the liver and urinary bladder. During the operation 500 cc. of whole blood was given, and the blood pressure was stable throughout. Nineteen hours after completion of the operation the patient suddenly became cyanotic, with profuse diaphoresis and hypotension. Despite symptomatic treatment he died.

Autopsy demonstrated the primary tumor to originate from the prostate. There was an embolus straddling the pulmonary artery bifurcation, and the lungs were congested and hyperemic. There were metastatic nodules over the pleural surfaces of both lungs. Here, again, the size of the embolus suggested the large veins of the legs as the source.

Age, presence of carcinomatosis, and restriction of activity all predisposed this patient to thrombosis and later to the massive embolism. The fever and tachycardia suggest a low-grade inflammatory process, such as phlebitis.

Case 4.—A 46-year-old male was hospitalized on March 15, 1954, for treatment of a trigeminal neuralgia on the right, which began 18 months prior to admission. History, physical examination, and routine laboratory studies were normal except for a mild hypertension (166/96 mm. Hg).

On March 17, 1954, trigeminal neurectomy was attempted but was discontinued when the blood pressure fell precipitously. During the hypotensive episode, the patient became unresponsive. The blood pressure stabilized rapidly and remained stable during the immediate postoperative period.

During the first 24 hours after surgery he remained unresponsive but thereafter began to improve rapidly. Electrocardiograms revealed no diagnostic abnormality. During the next 10 days activity was limited by a residual weakness of the left side. After surgery there was a low-grade fever (99 to 100 F [37.2 to 37.8 C]) and tachycardia (80 to 90 beats per minute) for three days, after which he was afebrile. Serial electrocardiograms revealed no change during this period.

The patient continued to experience severe facial pain, and for this reason a right trigeminal neurectomy was carried out, with the patient under local anesthesia, on March 29, 1954. On completion of the procedure he was alert, and vital signs remained stable.

One hour after returning to his room he again became unresponsive, and marked rigidity was noted over the right side of the body. His blood pressure was 120/80 mm. Hg, and slight cyanosis was noted. Improvement followed administration of oxygen and tracheal aspiration. Six hours after surgery he appeared more responsive, and the rigidity disappeared. Deep tendon reflexes were equal bilaterally. The blood pressure was stabilized at 150/90 mm. Hg, and the cyanosis had disappeared.

He died suddenly 13 hours after completion of the procedure. Immediately preceding death there had been no significant change in findings.

Autopsy revealed an antemortem clot occluding the left pulmonary artery, and the left lung was filled with blood. An additional finding was a recent area of myocardial infarction localized in the interventricular septum. An incidental finding was a small carcinoma of the prostate.

The limitation of activity following the first operation may well have been a predisposing factor to thrombus formation. The transient hypotension during the first procedure probably coincided with the myocardial infarction; however, rapid stabilization of vital signs and the lack of electrocardiographic changes gave little reason to suspect this clinically.

Comment

Pulmonary embolism was demonstrated in 118 (12.5%) of 943 autopsies of adults, and embolism was considered to be directly responsible for death in 5.2% of the cases. McCartney[3] found an incidence of embolism of 10% in 25,771 autopsies; however, fatal embolism accounted for only 2.67% of the deaths. This compares closely with the collective study of Bailey,[1b] who found the incidence of fatal embolism in 80,802 autopsies to be 2.6%. The disparity between our results and those of others probably arises from the difference in size of the series studied.

Of 118 cases of pulmonary embolism reviewed, 96 occurred either in medical patients or in surgical patients in whom no operation was performed. Twenty-seven deaths in this group were considered directly attributable to the embolism. In 17 instances embolism was associated with cardiovascular disease. Nine patients had some form of cancer, and in one patient debility followed a severe rheumatoid arthritis. In 69 patients the embolism was considered sublethal; the primary cause of death was cardiovascular disease in 51, cancer in 13, renal disease in 3, and cirrhosis and an undefined anemia in one case each. The importance of pulmonary embolism in medical patients has been emphasized by Carlotti and associates.[4] They observed that more than 50% of all pulmonary emboli occurred on the medical services during a period when there were twice as many surgical as medical admissions. Embolism was associated with heart disease in 66% of these patients.

In this series postoperative fatal pulmonary embolism was proved by autopsy in 22 patients during a period when 26,688 major operations were performed. This incidence (0.082%) is comparable to that found by Wilson[5] (0.08%) but considerably lower than the average of many collected series. Bailey[1b] found an average incidence of 0.23% in 462,381 operations and others have reported similar results.[6] DeBakey[1d] emphasized the importance of an "irregular wave-like periodicity" that produces wide fluctuations of incidence. Another factor that probably contributes to our lower incidence is the inclusion of only those cases proved by autopsy examination. We feel justified in excluding cases in which the diagnosis of fatal embolism was based on clinical impression alone.

It is important to differentiate, in any sudden postoperative cardiopulmonary complication, between myocardial infarction and massive pulmonary embolism, since treatment of the two conditions is considerably different. While tachycardia, dyspnea, diaphoresis, and hypotension may be prominent findings in either instance, cyanosis is not commonly observed in myocardial infarction unless cardiac failure is associated. Sixteen of the 22 patients in this study were cyanotic prior to death. Poltz[7] has also emphasized this important differential point. Chest pain was not common in our series; however, others have described the pain of massive embolism as indistinguishable from that of myocardial infarction.[8]

The relationship in this study between fatal pulmonary embolism and such factors as age, sex, types of operations performed, timing between operation and death, and timing between onset of symptoms and death are in general comparable to those observed by others.[9]

Several factors are worthy of further consideration: 1. Four of the 22 deaths occurred during the first 24-hour period following operation. 2. In almost one-half of the patients activity was restricted prior to operation. 3. Low-grade fever and tachycardia were present preoperatively in five of six patients who died within the first 72 hours after operation.

These findings suggest that an underlying thrombotic process was present at the time of surgery. The possibility that thrombosis may exist in patients referred for surgery after a period of preoperative evaluation or conservative care is an important and often little-considered potentiality.

Hunter[10] found that 50% of patients autopsied who had died after variable periods of confinement to bed had deep vein thrombosis. Of all factors etiologically significant in thromboembolism, no other appears more significant than the limitation *of normal activity imposed either* by the patient's disease or by the restrictions of hospitalization. Such restriction, though often relative, may result in a reduction of venous flow, which doubtless forms the broad base upon which all thromboembolic phenomena are dependent.

The preoperative evaluation of all surgical candidates should include a careful study of factors that might predispose to potential or actual thrombotic disease, such as advanced age, cancer, obesity, infections, heart disease, dehydration, anemia, or a history of previous thromboembolic disease. A normal level of activity should be resumed prior to any elective surgical procedure. The importance of correcting abnormal physiological states, including anemia and dehydration, and the use of appropriate measures to facilitate venous return from the lower extremities, hardly need be mentioned. The use of intravenous infusions in the lower extremities of patients who may be limited in activity postoperatively should be condemned.

It is our opinion that the inability to control postoperative pulmonary embolism by early ambulation and other therapeutic measures may represent failure to recognize the presence of a thrombotic process preceding the surgical procedure. Indeed, it is possible that some individuals with a low-grade phlebitis before operation may form a fresh, poorly adherent, propagating thrombus during the operation if the venous return from the lower extremities is reduced significantly. In the immediate postoperative period choking, vomiting, straining hen recovering from anesthesia, or activities assoted with early ambulation may produce sudden changes in venous flow that could readily dislodge a loosely adherent clot and result in a fatal pulmonary embolism. *Institution of measures to prevent incipient thrombosis in the preoperative period* would then seem to be of equal importance to those routinely recommended during the postoperative period.

Summary

During the past 10-year period pulmonary embolism was demonstrated in 118 of 943 autopsies of adults (12.5%). Fatal pulmonary embolism occurred in 22 patients postoperatively. In the same time interval 26,688 major operations were performed; this resulted in an incidence of 0.082%. Four of the 22 postsurgical patients died during the first 24 hours following operation. In each instance a low-grade fever and tachycardia was associated with reduced levels of physical activity imposed by at least one week of hospitalization before surgery.

The combination of restricted activity, fever, and tachycardia prior to operation and a sudden fatal embolism in the immediate postoperative period strongly suggests the presence of thrombosis prior to the time of surgery. It is difficult to establish with certainty the frequency of thrombosis prior to operations; however, in the case of all patients restricted to levels of activity below normal there should be a high degree of suspicion.

It is possible that many fatal pulmonary emboli originate from a low-grade phlebothrombosis that begins before operation. In those instances *preoperative prophylaxis is* of equal importance to preventive measures instituted in the postoperative period.

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POLYNEURITIS OCCURRING DURING HYDRALAZINE THERAPY

REPORT OF TWO CASES AND DISCUSSION OF ADVERSE REACTIONS TO HYDRALAZINE

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Areas of soreness and numbness developed in two patients who were being treated for hypertension. In one the pain was especially severe and accompanied by weakness of certain muscles; in both patients the neurological findings were characteristic of polyneuritis. Remission of these symptoms followed promptly after the use of hydralazine as part of the antihypertensive treatment was discontinued. The patients had been receiving 700 and 600 mg. of hydralazine, respectively, per day. These dosages are considered rather high, and the polyneuritic symptoms have occurred only in these two instances among 700 patients treated with hydralazine during a five-year period. A syndrome resembling lupus erythematosus has been seen in six instances. There was evidence that the two patients here discussed were predisposed to polyneuritis by a previous low dietary intake of pyridoxine. It is recommended that polyneuritis occurring under these conditions be treated by discontinuing the hydralazine therapy and administering pyridoxine.

The syndrome resembling lupus erythematosus is a well-known and dramatic complication of hydralazine (Apresoline) hydrochloride therapy.[1] Other potentially troublesome characteristics of hydralazine are not so well known. For example, it is not generally known that hydralazine, like isoniazid, can form a stable chelate with certain trace minerals and that it is an antienzyme for several biological systems.[2] Experience with two patients suggests that hydralazine, like isoniazid, may cause peripheral neuritis, possibly by interference with pyridoxine metabolism. The English-language literature on the subject has been reviewed, and no report of polyneuritis occurring during therapy with this drug has been found. Biehl and Vilter,[3] however, in discussing polyneuritis due to isoniazid, suggested that hydralazine, because of its chemical structure, might also cause certain specific vitamin deficiencies in man.

Report of Cases

CASE 1.—A 62-year-old man was admitted to the Veterans Administration Hospital, Iowa City, on June 1, 1954. One year prior to admission the patient had noted fatigue and exertional dyspnea. Four months prior to admission he developed severe retro-orbital and occipital headaches, nausea, and vomiting. Because of progressive decrease in vision, he consulted an ophthalmologist and was told that his blood pressure was "245" mm. Hg. His vision became more blurred, and he noted swelling of the ankles and hands. These complaints brought him to the hospital.

His medical history was negative. There was no history of diabetes mellitus, and the family history was negative for pertinent disease. For years he had drunk two to three bottles of beer per day, and usually one-fifth gallon of whiskey each week. Physical examination on admission revealed the patient to be a well-developed, well-nourished, florid-faced man. Blood pressure was 250/140 mm. Hg. Funduscopic examination revealed bilateral papilledema, flame-shaped hemorrhages, soft and hard exudates, marked narrowing of the arterioles, considerable arteriovenous nicking, and early distention of the veins. The left border of cardiac dulness was outside the left midclavicular line. There was a grade 1 apical systolic murmur, and the aortic closure sound was accentuated markedly, but there was no evidence of cardiac failure. All peripheral pulses were palpable. Neurological examination showed reflexes to be equal and physiologic on the two sides, and there was no evidence of sensory or motor deficit. His body weight on admission was 152 lb. (68.9 kg.). After the first week of hospitalization, his weight fluctuated between 138 and 144 lb. (62.6 and 65.3 kg.) throughout his stay.

Initial laboratory examinations, including red blood cell count, hemoglobin level, sedimentation rate, serologic test for syphilis, blood urea nitrogen and creatinine levels, plasma carbon dioxide content, and serum chlorides level, were normal. White blood cell count was 12,400 per cubic millimeter, with 74% of the cells mature polymorphonuclear leukocytes. Urinalysis revealed 2+ proteinuria, 70-80 white blood cells, and 11-15 red blood cells per high-power field. No urinary glucose was found on a number of examinations. A test for pheochromocytoma with use of phentolamine was negative. On June 23, 1954, the blood urea nitrogen level was 33 mg.%, and it remained at about this level until Aug. 10, 1954, when it fell to 21 mg.%. After this date, the blood urea nitrogen level was consistently normal. Phenolsulfonphthalein excretion in two hours was 66%. Cephalin flocculation test, total serum protein level, and serum albumin and globulin levels were normal. Several electrocardiograms revealed left ventricular hypertrophy. Four urine cultures revealed no growth. Initial x-ray examination of the chest revealed left ventricular hypertrophy. Intravenous pyelograms showed poor function. Retrograde pyelograms revealed findings compatible with changes due to chronic pyelonephritis. Cultures made from urine of each kidney at this time were negative for bacteria. Gastric analysis was done without the use of histamine, and no free acid was found. A tubeless gastric analysis,[4] however, was positive for free gastric acid, and in December, 1954, a duodenal ulcer, apparently new and active, was demonstrated by upper gastrointestinal x-ray series. Renal function studies performed on Aug. 18, 1954, revealed the glomerular

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filtration rate (with use of inulin) to be 65 ml. per minute per 1.73 sq. m., the renal plasma flow (with use of sodium para-aminohippurate) 260 ml. per minute per 1.73 sq. m., and the filtration fraction 25%.

The patient was treated initially with a 500-mg. sodium diet, subcutaneously given hexamethonium chloride, and orally given hydralazine. The dose of hexamethonium was gradually increased from 5 mg. to 40 mg. two times a day. Hydralazine doses were slowly raised from an initial dose of 10 mg. four times a day to a total daily dose of 700 mg. a day (fig. 1). By the 25th hospital day, the blood pressure had fallen to 160/110 mm. Hg, and proteinuria, papilledema, and many of the fundic exudates and hemorrhages had disappeared.

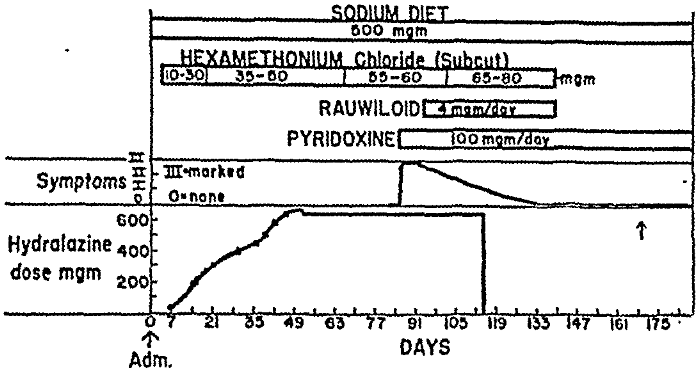

Fig. 1 (case 1).—Relationship between drug administration and symptoms of polyneuritis as estimated from review of chart notes. Total daily dose of hydralazine was 650 mg. from 51st day of hospitalization to 114th day. By 169th day of hospitalization (arrow) all symptoms of polyneuritis had disappeared.

On the 83rd hospital day the patient began to complain of soreness and numbness of the right ankle, and five days later soreness and numbness occurred in the same area on the left foot. At this time a clot test for L. E. cells was negative. The area of involvement gradually increased in size until there was a hand-sized area of involvement below and anterior to the external malleoli on both lower extremities. In both areas there was decreased perception of pin prick and cotton, and the patient complained bitterly of numbness and pain. Five days after the symptoms appeared, therapy with 100 mg. of pyridoxine a day by mouth was started. Within two weeks after the institution of the pyridoxine therapy the patient complained less of the numbness and tingling of his feet, and the area of involvement began to decrease in size. Nevertheless, shortly after this, hydralazine was withdrawn because it was thought to be the etiological agent. Seven weeks after onset, the area of numbness had decreased in size until it was found only in a 4-cm. circular area on each foot. Eleven weeks from onset, numbness and all symptoms referable to the neuritis had disappeared (fig. 1). A neurological consultant who examined the patient during the acute phases of the illness agreed with the diagnosis of peripheral neuritis.

Subsequently, the patient was treated with the alseroxylon fraction of Rauwolfia serpentina (Rauwiloid), the alkavervir fraction of Veratrum viride (Veriloid), and hexamethonium. On Oct. 19, 1954, the hexamethonium was withdrawn and therapy with orally given pentolinium tartrate was begun. In December, the patient was allowed frequent therapeutic leaves, and he was finally discharged from the hospital on May 20, 1955. He was seen on a follow-up visit on July 20, 1955, at which time he had no evidence of neuritis. He was doing well on a therapeutic program which included pentolinium and reserpine. Later, the patient moved to another state and contact was lost. Figure 1 shows the relationship of this patient's symptoms of neuritis to the intake of various drugs.

Case 2.—A 50-year-old man entered the VA Hospital, Iowa City, on Aug. 22, 1957, because of numbness in both feet and weakness and pain of his left foot and leg. This patient had been seen on six occasions at this hospital since Oct. 9, 1954, because of chronic, active glomerulonephritis. In 1930 he had an upper respiratory infection followed in one month by the appearance of dark urine and swelling of the hands and face. His blood pressure at that time was said to have been "180" mm. Hg. After this episode he had protein in his urine for one year with intermittent hematuria. He had relatively little difficulty from this, and in 1941 he passed an Army physical examination and was inducted. After one year of service the patient was given a disability discharge because of easy fatigability, bilateral costovertebral angle tenderness, and repeated episodes of proteinuria. He had been seen on a number of occasions at other VA hospitals from 1946 until his admission for the first time here in October, 1954.

On his first admission to this hospital the patient had blood pressure readings up to 230/140 mm. Hg, a few hemorrhages in the ocular fundi, a blood urea nitrogen level of 32 mg.%, and urine containing 2+ protein with 8 to 10 red blood cells per high-power field and a few narrow granular casts. The urinary specific gravity was fixed at 1.008 to 1.010.

During the three years between his first and his most recent admission to this hospital, the patient was treated with the alseroxylon fraction of Rauwolfia serpentina, hydralazine in doses up to 400 mg. a day, pentolinium, and mecamylamine hydrochloride in varying doses. The patient's blood pressure was maintained usually within the levels of 170 to 190 mm. Hg systolic and 90 to 110 mm. Hg diastolic, but he had considerable difficulty with drowsiness and lassitude from the Rauwolfia compound and orthostatic hypotension with the ganglionic blocking agents. Because of these symptoms and the difficulty in controlling his blood pressure within safe ranges, it was decided to treat him with hydralazine alone. On Feb. 1, 1957, hydralazine therapy was begun at 100 mg. four times a day, and this was increased to 125 mg. four times a day on March 7, 1957, when he was seen as an outpatient (fig. 2). He was seen again as on outpatient on June 6, 1957, and on July 11, 1957, at which time the hydralazine dosage was increased to 150 mg. four times a day. One month later, on Aug. 11, 1957, the patient stated that he noticed a suddenly appearing weakness of his left foot. Three days later he began to notice pain in his left leg and foot, and numbness developed in his right foot at about the same time. The pain was so severe that he was hospitalized in his home town prior to his admission to this hospital. There was no history of trauma to the leg or spine. He had taken only small amounts of aspirin in addition to the hydralazine since Jan. 6, 1957.

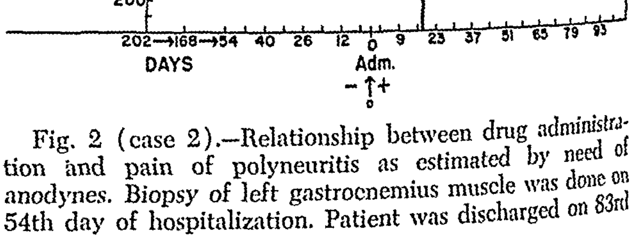

Fig. 2 (case 2).—Relationship between drug administration and pain of polyneuritis as estimated by need of anodynes. Biopsy of left gastrocnemius muscle was done on 54th day of hospitalization. Patient was discharged on 83rd hospital day.

Although he had imbibed much alcohol prior to 1955, he had done little drinking since that time. He had lost no weight, and he had had no recent infection. He knew of no exposure to heavy metals, had never had diabetes mellitus or symptoms of that disease, and had had no skin eruptions.

Physical examination on admission revealed a well-developed, slightly obese man who was in acute pain. He was alert and cooperative. The eyes were not remarkable, but the ocular fundi revealed grade 2 arteriolar sclerosis with moderate arteriovenous nicking and generalized attenuation of the arterioles. No exudates or hemorrhages were seen. The skin was normal. The heart was enlarged on the left side, and the second aortic sound was very loud. No murmurs were present. The blood pressure ranged between 240/140 and 210/130 mm. Hg in the arms. There were excellent femoral pulsations. The abdomen had an incisional scar in the right lower quadrant. Neurological examination revealed left peroneal palsy with atrophy and lack of active motion in the left tibialis anterior, extensor digitorum longus and brevis, and the extensor hallucis longus muscles. Bilateral hyperreflexia in the arms and legs and unsustained clonus at the ankle were present and had been present on previous admissions. No abnormal reflexes were noted. There was stocking-type hypesthesia to the junction of the upper and middle third of the legs bilaterally. No abnormal neurological findings were noticed in the upper extremities.

Laboratory studies on admission revealed the white blood cell count to be 10,900 per cubic millimeter with normal distribution of cells. Hemoglobin level was 10.3 Gm.%, as it had been on previous admissions. Urine values were the same as on his first admission. The hematocrit was 41 vol.%, blood urea nitrogen level 40 mg.%, creatinine level 3.7 mg.%, serum sodium level 130 mEq. per liter, potassium level 4.9 mEq. per liter, chlorides level 111 mEq. per liter, and carbon dioxide content 21 mEq. per liter. Serum cholesterol level was 218 mg.%. Several cultures of the urine for bacterial growth were negative, as were three preparations of the peripheral blood for L. E. cells. Blood culture showed no growth. Lumbar puncture showed normal pressures, one cell, and normal sugar, chlorides, and protein levels and gold curve. A test for urinary coproporphyrin was negative. Electrocardiogram showed signs of early left ventricular hypertrophy. The chest film revealed slight rounding of the left ventricular border. Blood sugar level was normal. Biopsy of the left gastrocnemius muscle revealed only atrophy of the muscle fibers. A retrospective diet analysis by the hospital dietician suggested that the patient had had a low-normal intake of B-complex vitamins for six months before admission.

The patient was treated with 25 mg. of pyridoxine given intramuscularly each day from the day of admission, and 12 days after admission daily injections of B-complex vitamins were begun. Hydralazine therapy was continued for 19 days after entry to this hospital. By the 33rd day the patient's pain had decreased considerably in amount, and by 40 days after admission there was active motion in some of the previously paretic muscles. By the 62nd day of hospitalization the patient was no longer taking any anodynes for leg pain and was able to walk with a fairly normal gait. At this time a strength-duration curve of the left tibialis anterior muscle was abnormal, but it became normal by the 75th day of hospitalization (fig. 3). His blood pressure elevations were moderated first with interrupted courses of therapy with chlorothiazide, but when his blood urea nitrogen level rose during this therapy (to 82 mg. per 100 ml.), chlorothiazide was withdrawn. Eventually, he was treated with reserpine alone. His arterial blood pressure values stabilized in the range of 160/105 mm. Hg, and he left the hospital on the 83rd day after admission. When last seen on Jan. 16, 1958, the patient's neuritis was remarkably improved and he had only a minor degree of paresis in his extensor digitorum brevis muscle and some residual numbness of the toes of his right foot.

Comment

Schroeder has discussed recently the metabolism of hydralazine in detail.[2] He states that the drug, besides being a chelating agent, is a carbonyl reagent and forms easily dissociable complexes with sulfhydryl groups on cystine, gluthathione, 2, 3-dimercaptopropanol, and other simple mercaptans. It is an antienzyme for several systems, including known or suspected pyridoxal enzymes, such as DOPA carboxylase and histaminase. Although hydralazine does seem to interfere with conversion of pyridoxal to its metabolite 4-pyridoxic acid, it is not known whether it causes clinical deficiency of vitamin B_6 to develop. Isoniazid, chemically similar to hydralazine, promotes the excretion of a pyridoxal-isoniazid complex in the urine of patients taking the drug. When isoniazid is given in large doses to nonalcoholic tuberculous patients or when it is given in moderate doses to alcoholic patients, peripheral neuritis frequently develops, presumably because of pyridoxine deficiency.[3]

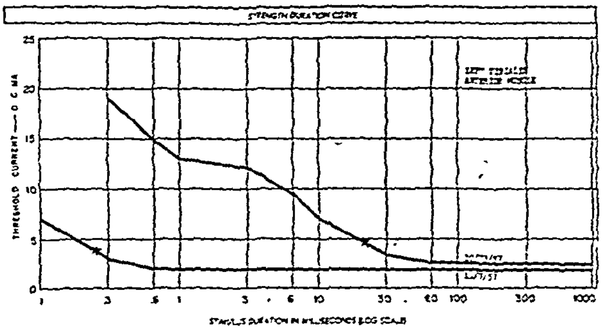

Fig. 3 (case 2).—Strength-duration curve of left tibialis anterior muscle. Curve taken on Oct. 23, 1957, shows (from right to left) an early upward rise and discontinuities. Chronaxy is 20 msec. This is curve of denervation. Curve of Nov. 7, 1957, shows chronaxy of 0.2 msec., and shape of curve is normal.

A cause and effect relationship between hydralazine administration and the development of peripheral neuritis is strongly suggested in these two patients. The first patient was in this hospital for 11 weeks before the neuropathy developed. During this time he was on a diet containing 500 mg. of sodium per day, but with adequate vitamins. The patient did not lose weight. There was no known infection during this time. Tests of the urine on several occasions were negative for bacterial growth. There was no evidence of diabetes mellitus or other metabolic abnormality, and the patient had had no unusual medicament prior to the development of his neuritis. More important in establishing hydralazine as the cause of this patient's difficulty was his gradual response to pyridoxine and his rapid relief of symptoms when hydralazine therapy was stopped.

The clinical course of the second patient's peripheral neuritis also suggests that hydralazine was an etiological factor. This patient had been followed over 46 months by us. Although he had been a moderately heavy drinker of alcohol in the past, he had drunk little alcohol in the 12 months prior to his present admission. His state of nutrition was good. There had been no intercurrent infections. The only drugs taken were those described in his history. Hydralazine had been taken regularly in large daily doses for nine months. This patient, like the first, had no history of metabolic disease, hematoporphyrinuria, collagen disease, or neoplasia. The patient's chronic glomerulonephritis had been slowly progressive over many years, and, except for the significant increase in arterial blood pressure and in frequency of headaches, no other problem had arisen from this disease. Again, the patient's response to withdrawal of hydralazine was dramatic, for pain became much less severe in seven days and had practically disappeared in three weeks after the drug therapy was stopped. Neither patient exhibited cheilosis, glossitis, seborrheic dermatitis, or unusual depression—signs reported to occur during experimentally produced pyridoxine deficiency in man.[5] Anemia, also observed in human pyridoxine deficiency, had been present before hydralazine therapy was started in the second patient and was apparently not aggravated by the drug.

The dietary intake of pyridoxine in both patients was probably at the lower limit of estimated daily requirements,[6] and this factor may have played a role in the development of the neuritis. The first patient was on a diet containing approximately 1 mg. of pyridoxine per day for many weeks. He was not given vitamin supplements until after the neuritis appeared. The second patient had peculiar dietary habits. Although married, he frequently dined away from home on a diet adequate in calories and with approximately 1 mg. of pyridoxine each day, as calculated by the dietician. Even though such a retrospective analysis is fraught with error, particularly when the intake of pyridoxine is estimated, it is probable that this patient did not receive a surplus of vitamin B in his diet. On the other hand, there is no evidence that these patients actually received a diet grossly deficient in vitamin B_6. Their income was at, or above, the average for our patient population, and their general state of nutrition was good.

It is possible that the production of polyneuritis after hydralazine therapy may be dependent on at least two factors: (*a*) long-continued large daily doses of the drug, and (*b*) a relatively low intake of vitamin B_6. However, since these factors are probably interrelated, it may be postulated that the neuritis could be prevented by vitamin B_6 supplementation when large doses of hydralazine are given. The neuritis might appear at times with smaller doses of the drug if dietary vitamin B_6 were in the lower range of normal, as has been suggested with isoniazid.[3]

There is no concrete evidence to support the idea that this drug interferes with any other vitamin B preparation, although to our knowledge this has not been explored. There is no information to support the view that carbohydrate metabolism is disturbed in any way.

These two case reports, added to the literature on the subject, suggest that toxic reactions to hydralazine can be grouped into three general categories: (1) acute or cardiovascular effects, (2) connective tissue, blood, and skin reactions, and (3) polyneuritis syndrome.

Acute Cardiovascular Effects.—Such reactions as tachycardia, nasal stuffiness, occipital headache, dyspnea, malaise, anxiety, nervousness, retrosternal distress, peripheral edema, and, at times, angina pectoris, can be ascribed largely to the effect of the drug on the cardiovascular system. They may be caused by the release of "histamine-like" substances, secondary to inhibition of histaminase by hydralazine[7] or to the central depressor action of the drug.[8] Tingling in the extremities, as noted by Moyer,[9] and the transient paresthesias mentioned by other authors[10] after intensive administration of the drug, likewise, are probably secondary to this cardiovascular effect.

Connective Tissue, Blood, and Skin Reactions.—Minor musculoskeletal symptoms frequently occur with hydralazine therapy without other signs of serious disease.[11] In an occasional patient these symptoms may be severe enough to necessitate stopping the drug therapy, but generally they are mild and tend to disappear as therapy is continued.

A more serious disorder, characterized by arthritis, pancytopenia, fever, various skin lesions, pericardial and pleural effusions, increase in serum globulin level, false-positive serologic tests for syphilis, and positive lupus erythematosus (L. E.) tests on peripheral blood, has been demonstrated to be caused by hydralazine, usually when it is given in large amounts for long periods. Morrow, Schroeder, and Perry[1] did not believe that this hydralazine-produced lupus erythematosus-like reaction was caused by a hypersensitive state. They felt it was better explained by depletion of a trace metal or by an imbalance between essential and abnormal trace metals, in view of hydralazine's known chelating ability. Dustan and co-workers[12] likewise objected to classifying this syndrome as a hypersensitivity state, chiefly because some of their patients were able to resume taking the drug at a lower dose without recurrence of symptoms. They also felt that it was of significance that the syndrome occurred in persons with no allergic history and that it appeared when the doses used were very large and therapy prolonged.

On the other hand, the clinical picture of the disorder, its relation to other rheumatic states (particularly to lupus erythematosus), and the prompt remission of symptoms when the drug is withdrawn have caused much speculation as to whether this complication indeed may represent a hypersensitivity reaction.[12] Reynolds and Caldwell[13] reported a patient who developed tachycardia and blood pressure elevation when first given hydralazine, acute rheumatic symptoms when the drug was given a second time one month later, and the clinical picture of acute rheumatoid arthritis in four days when the drug was given a third time six months after the second course of administration. A positive blood L. E. cell test was not obtained. However, these authors felt that this patient's reaction to the drug was of the lupus erythematosus type. They also considered the small dose and brief period of therapy necessary to reproduce the symptoms as strong evidence against both the toxicity and depletion hypotheses. Slonim[14] also reported a patient who had an exacerbation of symptoms of the hydralazine lupus erythematosus–like disease after a total of only 150 mg. of the drug had been taken in three doses.

If sensitization to hydralazine is responsible for the lupus erythematosus-like syndrome, recorded observations make it appear that the hypersensitivity is of a complex and unusual type. Nevertheless, our experience with this syndrome makes the hypersensitivity explanation a tempting one but does not settle the issue. We have observed six patients develop this syndrome, all after taking relatively large doses of the drug. The lowest dose which caused these symptoms to appear initially was 400 mg. per day continued over two and one-half months. Three of these patients were given this agent a second time, and in each instance a recurrence of symptoms appeared in four days to three weeks. A most dramatic example of this was seen in a 54-year-old woman who was readministered 25 mg. of hydralazine twice a day six months after the acute symptoms of hydralazine lupus erythematosus–like disease had subsided, although L. E. cells were still present in the blood. Two days later, without our knowledge, she began a transcontinental automobile trip. After traveling for one day in the bright sun of the Mojave Desert and having had a total dose of 300 mg. of hydralazine, she developed fever, prostration, and a severe erythematous eruption over the exposed parts of her body. Hydralazine therapy was discontinued, and cortisone was given. The patient recovered gradually in a fortnight.

Blood dyscrasia other than that associated with the hydralazine lupus erythematosus–like syndrome has been reported after hydralazine therapy,[15] but this is rare. Skin rashes of an erythematous nature, not associated with the rheumatic syndromes, have been reported[11]; however, they are seldom a problem in the usual clinical use of hydralazine.

Polyneuritis Syndrome.—Polyneuritis syndrome, as described in this communication, may appear after long therapy at high-dosage levels of hydralazine. It is produced possibly by interference with pyridoxine metabolism; it is readily reversed with withdrawal of the drug, and, perhaps, with pyridoxine dietary supplementation.

In the two patients presented there was no evidence of the hydralazine lupus erythematosus–like disease. L. E. cell preparations in both cases were negative on several occasions, and there was no evidence of hypergammaglobulinemia, positive cephalin flocculation tests, arthritis, fever, skin rash, false-positive serologic tests for syphilis, or involvement of pleural or pericardial linings. Likewise, the blood pressure elevation in both patients failed to show the good response to hydralazine therapy usually seen in association with the lupus erythematosus–like reaction. This evidence, the subsequent course of the patients, and the demonstration of interference with vitamin B_6 metabolism by hydralazine in vivo[2] suggest that polyneuritis may occur as a complication separate from the well-known lupus erythematosus–like syndrome.

Although no instance of the neuritic complication in man has been reported in the English literature, Comens[16] described convulsions and central nervous system symptoms in dogs treated with large doses of hydralazine for long periods. He noticed also that some dogs were unable to stand and ascribed this to weakness. Most of these dogs developed anemia, altered electrophoretic pattern of the serum proteins, leukopenia, hypergammaglobulinemia, hypocholesteremia, and L. E. cells. However, there is no information regarding possible pyridoxine deficiency as a cause of the convulsions or possible polyneuritis to account for the animals' difficulty in standing.

The incidence of polyneuritis after hydralazine therapy must be quite low. In about 700 patients treated with hydralazine in our hospitals during the last five years, most with low-dosage therapy, only the two patients described have been known to develop peripheral neuritis. In this same group, only the six patients mentioned above have been known to develop the lupus erythematosus–like syndrome.

Summary and Conclusions

Two patients developed signs and symptoms of peripheral neuritis while being given large doses of hydralazine. Because hydralazine is known to interfere with pyridoxine metabolism in vivo and has chemical actions similar to isoniazid, it is suggested that the polyneuritis was secondary to the hydralazine ingestion.

Adverse reactions to hydralazine may be classified broadly into three categories: (1) those affecting the cardiovascular system acutely, (2) those producing connective tissue, blood, and skin disorders, and (3) those producing polyneuritis. If peripheral neuritis appears in a patient under treatment with large doses of hydralazine, the drug should be considered as a possible causative or precipitating factor, especially if pyridoxine intake is low. Until more precise information is gained concerning the etiology of polyneuritis occurring under these circumstances, hydralazine therapy should be discontinued and the patient should be given pyridoxine until maximal recovery occurs.

Dr. David M. Paul supplied the strength-duration curves depicted.

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REHABILITATION IN RESPIRATORY INSUFFICIENCY.—Greatly expanded knowledge of the physiology and biochemistry of respiration, together with the technical skills developed in the care and rehabilitation of patients with respiratory paralysis due to poliomyelitis, now make it possible to apply an effective method of total care for the treatment of patients with severe respiratory insufficiency due to a great variety of causes. The fundamental principles are essentially the same in the treatment of all disorders in which there is inadequate pulmonary ventilation associated with respiratory acidosis, disturbed metabolism right-sided heart strain or failure and accompanying psychobiological changes. The first essential is adequate respiratory assistance to relieve the patient of the work of breathing and to correct respiratory acidosis. This may require tracheostomy, artificial respiration for varying periods of time, then gradual reduction in respiratory assistance, a graduated exercise and strengthening program and the whole gamut of services included in the concept of rehabilitation. While this regimen of management does not include any new methods or concepts, it does involve the coordinated application of technics which are usually utilized as separate treatment procedures or as brief supportive measures without adequate understanding of the needs for full restitution of function. When the available technics are applied in a well-coordinated manner, the prognosis for recovery can be very remarkably changed for the better in seemingly hopeless situations.—Leon Lewis, M.D., Application of Rehabilitation Technics in Respiratory Insufficiency, *Archives of Physical Medicine and Rehabilitation,* March, 1958.

STUDY OF 1-PHENYL-2-AMINOPROPANE ALGINATE (LEVONOR), NEW ANORECTIC

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A group of 80 overweight patients who were on a diet designed to reduce weight received, in addition, one 5-mg. tablet of 1-phenyl-2-aminopropane alginate three times a day. This drug was found, in animal experiments, to produce a delay of the feeding reflex without significant stimulation of motor activity. In the human subjects studied, the combined treatment was accompanied by a mean weight loss of 0.9 kg. (2 lb.) per week. The doses used in this experiment did not cause untoward side-effects.

Although a few physicians maintain that the relationship of overweight to serious health impairment is casual, not one denies that the patient who keeps his weight within a normal range will usually experience better health and longer life.[1] Unfortunately, no simple method has yet been found to help the patient regain and maintain an ideal weight through correction of faulty food habits and regulation of food intake. Such factors as heredity, environment, traumatic disturbances, changes in physical activities, and, rarely, endocrine imbalance, are variables that must be taken into consideration in the planning of any weight reduction program.

Every physician recognizes what is necessary to bring about a loss of excess weight: restriction of the diet to bare essentials of proteins, vitamins, and minerals, which causes burning of the stored fat as the chief source of energy. Inevitably, when food intake is restricted sufficiently to induce a negative energy balance, a weight loss ensues, unless, of course, physical activities of the patient are restricted abnormally. Nevertheless, control of appetite is not easy, and "more difficult than the prescription of a diet is keeping the patient on the prescribed program."[2]

Drugs for Suppression of Appetite

Ideal Qualities.—A recent survey[3] reveals that a majority of physicians consider the use of a drug a prerequisite during the initial stage of dieting to help the patient control his intake of calories. By consensus, the ideal drug for treatment of patients who overeat has the following characteristics. 1. It is safe. Its physiological price is low, that is to say, it causes no disturbance of emotional and psychic balance, nor should it require routine use of barbiturates to counteract excessive stimulation. 2. It is effective in appetite suppression. 3. It provides minimal central nervous system stimulation without psychic excitation. 4. It is suitable for use late in the day without interference with normal sleep pattern. 5. It is well tolerated and does not cause constipation. 6. It is economical, with price suitable for immediate and maintenance dosage.

Drawbacks of Drugs Commonly Used.—In an analysis,[3] which included the study of 1,267 overweight patients, 909 were under treatment with both diet and drugs, only 321 by diet alone, and merely 37 by drug alone. Significantly, it was found that although anorexigenic drugs were used extensively most of the physicians interviewed were extremely critical of the difficulties associated with their use, especially in patients who had recently acquired the excess weight. The chief drawbacks were (1) overstimulation followed by weakness, fatigue, depression, and morning anorexia; (2) insomnia, restlessness, and emotional disturbances requiring the use of barbiturates; (3) failure to suppress night-time urges to eat and drink; (4) constipation; (5) expense; and (6) unpredictability of "timed-release" forms of medication in vivo. In brief, the side-effects appear to be the most persistent stumbling block encountered in the use of drugs to curb the appetite.

In recent years[4] various compounds belonging to the sympathomimetic amine group have been used clinically for the suppression of appetite. Strangely, the property commonly shared by these optically active compounds is one of psychic stimulation, while the appetite-suppressing factor is secondary and highly variable. For this reason, the clinician is skeptical as well as friendly toward any new compound that can be demonstrated pharmacologically to exert appetite suppression.

A New Anorectic

Recently, a new agent, 1-phenyl-2-aminopropane alginate (Levonor), has been found to delay the feeding-reflex in animals, with negligible stimula-

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tion on the psychic cerebral centers. It is a well-characterized substance identifiable by its distinctive infrared and x-ray spectrums.[5] Studies were done of its acute toxic effects in the oral form (on mice under controlled environmental conditions of temperature and relative humidity) in order to compare the new substance with several common amphetamine compounds. The results indicate that 1-phenyl-2-aminopropane alginate *is one-tenth* as toxic as dextro amphetamine sulfate, on the basis of the weight of the respective salts. According to another commonly accepted method of comparison (pressor amine/pressor amine), the 1-phenyl-2-aminopropane alginate was one-fifth as toxic as the dextro amphetamine.

A critical test of the effectiveness of the new drug in suppressing appetite was performed in male monkeys (Macaca rhesus). These animals are normally voracious eaters. After 24 hours of fasting, the monkeys were given 1-phenyl-2-aminopropane alginate orally in doses ranging from 1 to 5 mg. per kilogram of body weight, and the results were pronounced suppression of appetite without overstimulation. No side-reactions, such as hyperactivity, tremors, or jitteriness, were observed.

Determinations of anorectic effect of 1-phenyl-2-aminopropane alginate and four other anorectic drugs were made in dogs.[6] Twenty mongrel dogs, individually caged, were observed while normal feeding habits were stabilized during the four days preceding treatment. During this period each of the animals received 0.6 kg. of food daily, which they consumed five minutes after the food was offered. Water was given as needed. Each drug was administered orally, in capsule form, once daily for three days. Food was offered exactly one hour after each drug was given and an interim of four days allowed between the first and second parts of the cross-over tests, to obviate any effect of the treatment period. The dogs were observed immediately after treatment and watched carefully for six hours after feeding. Again, they were observed for four days after the last treatment in the second part of the trial.

The drugs used in this test, at dose levels of 5 mg. per kilogram, were levo amphetamine sulfate, dextro amphetamine sulfate, phenylpropanolamine, and 1-phenyl-2-aminopropane alginate. These tests clearly demonstrated the superiority of 1-phenyl-2-aminopropane alginate, since it produced pronounced anorexia that persisted for more than three hours. Signs of hyperexcitability, characteristic of patients given the other preparations tested, were notably absent in the subjects given 1-phenyl-2-aminopropane alginate.

In addition to these animal studies, preliminary clinical observations, made on more than 173 patients [6A] over periods of at least 12 weeks, were most promising. Since the side-effects of most anorectics militate against the long-term treatment of the overweight patient, we undertook a clinical study to evaluate the new agent.

Selection of Patients and Procedure

The procedure in the selection and preparation of our patients has been as follows.

First, a thorough physical examination is performed. This prerequisite, given at the start of treatment, helps to convince the patient of the seriousness of the problem and the importance of his keeping on the restricted diet. It also reassures the patient that the physician has not overlooked the possibility of some obscure glandular condition. Further, it helps persuade most patients that they are physically fit to withstand the rigors of dieting and thereby reduces the number of alibis at subs quent visits to excuse the lack of cooperation.

Second, explanation and encouragement a given. The cause-and-effect aspects of overweig are thoroughly discussed and the prescribed di explained in detail. Success depends to a high d gree upon the patient's understanding the princip of the treatment, namely, to provide the necessa food elements yet remove excess fat. Of greater i portance, the patient must realize that followi the diet does not cause "weakening." Whenev appetite-suppressing drugs are prescribed, the p tient should be instructed concerning their mode action and told what to expect by their use.[7] Sin misconceptions concerning diet are so varied th the physician cannot anticipate all, the patients a encouraged to ask questions.

Third, regular check-up visits are required. Mo patients are less apt to cheat if they know th must face the doctor's scales at regular interval Frequently, these visits have given us an opport nity to give additional education and encourag ment as well as to answer any new questions th the patient may have. Many patients benefit great by learning about the plateaus of weight loss an are helped immeasurably to achieve self-disciplin through these periodic conferences.

Fourth, appetite-suppressing drugs are use Since the physician is concerned with both th patient's comfort and the success of the regimen, i most instances we have recognized the importan role that appetite suppressants can play in helpin to reduce caloric intake. By obviating the marty dom of unsatisfied hunger during the early days o food restriction, the use of appetite suppressant helps to get the patient started on the right pat toward recovery without the usual frustration an self-pity that accompany a low-calorie regimen.

Fifth, post-weight-loss procedures are followed Overweight is a chronic affliction prolonged over a life span and requires close observation similar t that of diabetes mellitus. Each patient is impressed with this concept. Each is informed that weight loss is only part of the requirement and that maintenance of a desirable weight is even more important.[8]

Weight loss may be reasonably gradual, and once the ideal weight is achieved, frequent observation is necessary to maintain the patient's weight at the desired level. Throughout his lifetime the patient should weigh himself weekly at the same time and under the same conditions. If a gain is seen, the diet must be curtailed immediately and this regimen continued for a few days until the ideal weight range is restored. If weight gain is over 5 lb., the patient is advised to see his physician.

Results

Five-milligram tablets of 1-phenyl-2-aminopropane alginate were given three times a day, one-half hour before meals. Many patients received an added dose at 8 or 9 p. m. to curb the "television" or "bedtime" snacks. There were no signs of restlessness from this late dosage schedule. Many patients had previously been on therapy with amphetamines or amphetamine-like drugs with diet and had little success. Subsequently, these patients were given the new drug with encouraging results, and, in general, they were enthused about the control of appetite and lack of side-effects. In contrast, a small number of patients (approximately 6%), who were accustomed to the "lift" from the amphetamines, either alone or in combination with barbiturates, were difficult to manage with 1-phenyl-2-aminopropane alginate and considered failures.

The patients were seen on an average of every two weeks. Laboratory studies included complete blood cell counts and urine analysis on all patients; a representative number of patients also had basal metabolic rate and glucose tolerance studies. On return visits special attention was given to any changes in weight, heart rate, and blood pressure. The patients were carefully questioned as to the results of the new drug in controlling appetite, its effectiveness as compared with previously used anorectic agents, and the presence of any side-effects.

The average weekly weight loss for patients taking 1-phenyl-2-aminopropane alginate was 2 lb. There were no adverse changes that affected either the blood pressure or the heart rate. On the contrary, many hypertensive patients exhibited a reduction in blood pressures after weight loss. There was a remarkable absence of any side-effects. A single dose that is triple the usual 5-mg. dose causes no significant change in the blood sugar levels (table 1).

Our studies have defined the limitations as well as the indications for the use of the new anorectic. It can be used for a patient who has never taken amphetamines or amphetamine-type drugs (such as phenmetrazine or dextro amphetamine sulfate). It can be used for a patient who responds unfavorably to amphetamine drugs with such symptoms as sleeplessness, nervousness, tension, and a tight feeling in the neck. Since no effects have been observed on blood sugar levels nor on central vasomotor reflexes, the new agent is used in persons with diabetes mellitus and hypertension and in pregnant women.

When amphetamine is contraindicated late in the day, the new anorectic can be used adjunctively, in the evening, without causing insomnia. It also may be given in the evening for appetite control after a morning "timed-release" capsule effect has dissipated. It can be used as an adjunct when the amphetamine dosage cannot be increased due to its side-effects. In such instances, 1-phenyl-2-aminopropane alginate effectively suppresses appetite. Except as adjunctive therapy, the new anorectic is of little value in treating the depressed obese patient and the patient dependent on the analeptic effect of amphetamine for psychic stimulation.

TABLE 1.—*Blood Sugar Changes After Administration of 1-Phenyl-2-Aminopropane Alginate*

Case, No	Diagnosis	Dose, Mg.	Blood Sugar Level, Mg./100 cc. Fasting	At 1 Hr.	At 2 Hr.
1	Normal	15	89	82	86
2	Normal	15	112	118	94
3	Mild diabetes	15	168	144	148

Glucose tolerance tests, cholesterol and cholesterol ester determinations, and basal metabolic rates showed variable results. In general, these tests gave no indication of therapeutic needs. A few patients were found to have subclinical diabetes mellitus. These patients, like the others, responded to therapy, and their glucose tolerance curves returned to normal in accord with weight reduction. Rarely, a low basal metabolic rate and hypercholesteremia were found, which indicated the need for the addition of thyroid to the regimen.

Three case histories will serve to illustrate how 1-phenyl-2-aminopropane alginate can be used either with a strictly prescribed diet or with simple curtailment of food. A fourth shows a situation in which the new agent was not suitable.

Report of Cases

CASE 1.—A 15-year-old girl had been overweight, weighing 165 lb. (74.8 kg.), since an appendectomy 26 months previously. Since then she had gained 42 lb. (19.1 kg.). She had been overfed during convalescence, and patterns of excess eating and diminished exercise had been well established. Her obesity had forced her into social, athletic, and emotional retirement. Previous efforts at weight reduction had failed because of parental pressure and an inability to tolerate anorexigenic drugs.

A complete reorientation was attempted with both patient and family. Dietary reeducation was undertaken and gentle but firm instructions given. Therapy with 1-phenyl-2-aminopropane alginate, 5 mg. three times a day before meals, was started. The patient was surprised and pleased to find that her appetite was curtailed without any of the expected side-effects. In 11 weeks this patient lost 24.5 lb. (11.1 kg.). All activities have been resumed, and the outlook for attainment and maintenance of ideal weight appears promising.

Case 2.—In a 48-year-old male, frequent business lunches and dinners and marked curtailment of physical activities had resulted in a weight gain of 28 lb. (12.7 kg.) during the preceding 12 years. This had been insidious, and the patient always felt that it could easily be reversed. When he found it could not he asked for help, *realizing that his indigestion*, shortness of breath, and fatigue were directly related to his excess weight. He was very serious in his desire to lose weight but presented the problem of business meals and enforced physical inactivity.

We encouraged the patient to take up golf and to walk as much as possible. After careful study of the patient's eating habits, we suggested that he not mention his diet to colleagues or clients since this encouraged baiting and overeating. We prescribed 1-phenyl-2-aminopropane alginate, 5 mg. three times a day before each meal, to help him follow his diet. The patient quickly discovered that he could follow his regimen easily without eliciting comment as long as he made no mention of it. He experienced no side-effects. In 10 weeks, the patient lost 24 lb. (10.9 kg.), and during the five weeks preceding this report he has maintained the loss without difficulty. This case *exemplifies the value of careful explanation of the means of overcoming eating problems as well as the usefulness of a suitable anorectic that reduces the appetite without any* other effect.

Table 2.—*Average Weight Loss of Eighty Patients Taking 1-Phenyl-2-Aminopropane Alginate*

Av. Weight Loss/Wk., Lb.	Patients No.	Patients Total
0.1-1.0	23	28.8
1.1-2.0	27	33.8
2.1-3.0	15	18.7
3.1-4.0	8	10.0
4.1-5.0	4	5.0
5.1-6.0	3	3.7
	80	100.0

Case 3.—A 44-year-old male had received a "timed-release" type of medication in the morning for control of appetite during the day, but he could not take the drug in the evening for control of night-time craving. We prescribed one tablet daily at 7 p. m. of 1-phenyl-2-aminopropane alginate. This allayed the evening hunger and permitted the patient to restrict his caloric intake remarkably well without emotional disturbance or sleeplessness. The results were excellent.

Case 4.—A 41-year-old female *during the past eight years* had received frequent intermittent treatments for recurrent obesity. During the past four years, she had taken fairly regularly 40 mg. of dextro amphetamine sulfate and 60 mg. of phenobarbital each day. She liked the "lift" these drugs gave her and complained when they were withheld. A diet was prescribed for her, and she was given 1-phenyl-2-aminopropane alginate, 5 mg. three times a day. She lost 7 lb. (3.2 kg.) during the next eight weeks, a better result than she had experienced in the past, but she complained so much about the lack of stimulation that subsequently therapy with 1-phenyl-2-aminopropane alginate was stopped, and she returned to the old regimen. The patient was not suitable for therapy with the new anorectic.

Comment

A group of 80 overweight patients, ranging in age from 15 to 69 years, have been treated with 1-phenyl-2-aminopropane alginate and a properly maintained diet to determine the effectiveness of the drug in controlling appetite. Of the group studied, 70% were females and 30% males. The duration of therapy ranged from 1 to 38 weeks. The average weight loss for the group was 2 lb. (0.9 kg.) per week. A more detailed classification of average weight loss appears in table 2.

Our experience with 1-phenyl-2-aminopropane alginate was highly satisfactory. The incidence of disappointments experienced with anorectics in the past, principally those due to the adverse side-effects of amphetamines, was lessened markedly.

We have been using the amphetamine drugs for appetite control since their introduction more than a score of years ago and recognize that many *factors are determinants of their successful use.* Both reactions and gradual lessening of effectiveness are limiting factors to be considered in therapy with this group of compounds. We have tried nearly all new appetite suppressants as they have become available because we recognize their potential usefulness, in spite of the limitations that stem from the side-effects. These limitations impose precautions, which include (1) careful selection of patients; (2) explanation and forewarning of possible side-effects; (3) close supervision of each patient; and (4) frequent and gradual adjustment of dosage.

The most common cause of patient complaint is well known by such terms as jitters, nerves, irritability, overstimulation, or nervous tension, according to the vocabulary of the patient. Insomnia is next in the order of discomforts. Other complaints somewhat less common are of constipation, headache, apprehension, exhilaration, palpitation, weakness, fatigue, and, occasionally, nausea and vomiting. Many patients state that since they cannot take the usual appetite suppressants late in the day, they frequently yield to the temptation of evening snacks and night ice box raids, and thus their "cheating on eating" begins.

Since compiling the data for this paper we have had an opportunity to study the findings of another group of investigators in 1,395 cases[3] where 1-phenyl-2-aminopropane alginate was used in conjunction with diet, and the results are in general agreement with our own.

Preliminary studies to be published by us at a later date, in which placebos were compared with 1-phenyl-2-aminopropane alginate, with the use of the double-blind technique, indicate that the patients who were on a diet plus therapy with the new drug lost approximately 1.8 times the weight per week of another group of patients who were also on a regimen of lowered caloric intake but receiving placebos.

Summary

A new drug, 1-phenyl-2-aminopropane alginate (Levonor), was administered, in conjunction with diet, to 80 overweight patients. The average weight loss was 2 lb. (0.9 kg.) per week. We were particularly impressed with the marked reduction in side-effects with the new drug, as compared with our previous experience with other appetite suppressants. The fact that 1-phenyl-2-aminopropane alginate can be administered in the early evening without complaints of interference with sleep is an advantage to both physician and patient, since night-time eating is perhaps the most common cause of "diet cheating."

While 1-phenyl-2-aminopropane alginate appears at least as effective as other appetite suppressants, it seems to be better tolerated and allows for more freedom in adjusting dosage to meet individual patient requirements. We believe, therefore, that this new drug is a valuable and needed tool in helping overweight patients to reduce their caloric intake. On the other hand, the drug is of no value for the depressed obese patient or in cases where psychic stimulation is indicated. Our over-all impression is that weight reduction is better maintained when the loss is achieved at a physiologic and moderate rate.

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The 1-phenyl-2-aminopropane alginate used in this study was supplied as Levonor by Nordmark Pharmaceutical Laboratories, Irvington, N. J.

We wish to express our appreciation to John T. Fay Jr., M.S., for statistical analysis and Basil H. Candon, M.S., for technical correlation of data.

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PLEUROESOPHAGEAL LINE IN NORMAL CHEST ROENTGENOGRAMS

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For several years referring physicians have expressed skeptical curiosity regarding the nature and significance of the narrow oblique line of soft tissue density often seen across the upper mediastinum in the posteroanterior projection roentgenograms of normal chests. This line is usually 3-5 mm. wide and characteristically curves downward and to the left from the right apex toward the aorta. It is the shadow of a soft tissue plane outlined on both sides by air density, and it is projected through the air-filled trachea superimposed on the complex image of the upper portion of the thoracic spine and the manubrium, as illustrated in fig. 1A. There are many variations of contour. Some of the configurations produced by a large air bolus in the esophagus may be quite striking.

The pleuroesophageal line, formerly called the esophageal-pleural stripe, can be seen in about one-fourth of all routine roentgenograms of the adult chest. It is usually 3-5 mm. wide, curving downward and to the left from the apex of the right lung toward the arch of the aorta, but it exhibits many variations. Evidence here presented shows that it is the shadow of a soft tissue plane that separates the right lung from certain other air-filled structures in the mediastinum. It has no pathological or prognostic significance, but its normal variations should be studied and appreciated if false associations of the pleuroesophageal line with symptoms or suspected disease processes are to be avoided.

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Method

With good roentgenographic technique, with 90 to 120 kvp utilized, this line can be identified easily in approximately 25% of the routine chest films of the adult population. At lower voltages, this image will not be on the film unless the lung fields are overexposed. I have been using high kvp technique for chest roentgenography since 1951, and this technique was made routine practice at this hospital in 1954. All chest films are made at 72 in. distance, 110 kvp with 2 mm. Al filtration, Potter-Bucky grid, and exposure duration of 1/60 to 1/20 second. Only the duration of exposure and milliamperes are changed to compensate for variations of chest thickness. This technique provides three real advantages: 1. It reduces the radiation absorbed by the patient to the minimum, delivering a skin dose of about 20 mr (with scatter) to the thorax of an adult male. 2. It provides penetration of all parts of the thorax and upper abdomen, permitting clear visualization of soft tissue structures of the mediastinum that otherwise would be lost in the opacity of these heavy parts or obscured by the bone structures of the thorax. 3. It permits exposures of relatively short duration, minimizing the blurring of cardiovascular and pulmonary structures which are in rapid pulsation. The pleuroesophageal line is clearly visible only on chest roentgenograms exhibiting good penetration and sharp definition of the upper mediastinal structur There seems to be a definite trend toward mo common use of higher voltages in chest roentge ography, even among nonradiologists. This tr is being accelerated by the efforts being made reduce radiation exposures in diagnostic rad raphy. Since more and more physicians are b

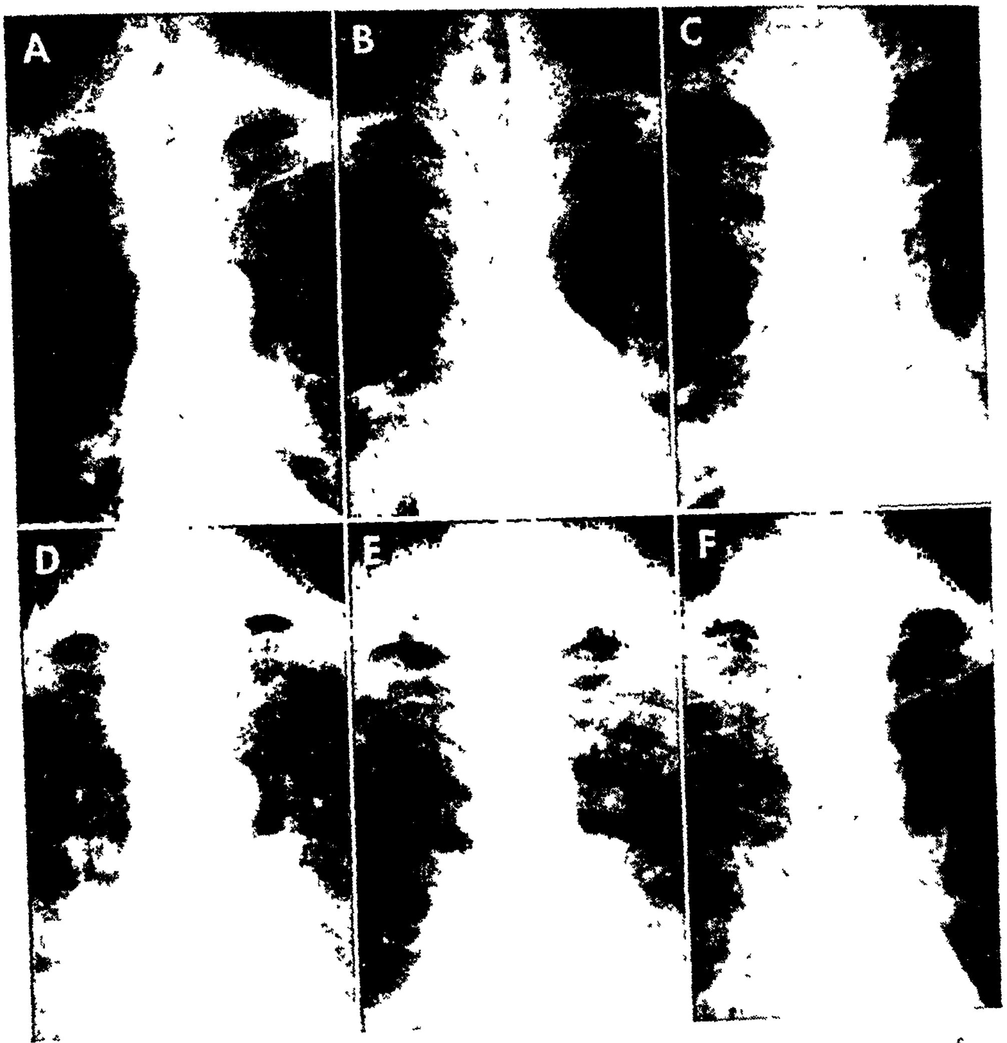

Fig. 1.—*A*, common configuration of pleuroesophageal line forming an arc from right apex toward aorta. *B*, Anteroposterior projection with patient in supine position. Left side of line is accentuated by ink marks; esophageal side is shown in contrast with air and barium. *C* (same patient with pneumomediastinum after an accident), funnel-shaped air column within esophagus is seen through air-filled trachea. Pleuroesophageal line may be identified, and careful inspection of line reveals air between esophageal wall and parietal pleura continuous with tissue planes of neck. *D, E, F,* effects of large air bolus in the esophagus demonstrated in three different individuals. Pleuroesophageal line is almost vertical, and air column can be followed into lower esophagus through heart shadow. Large air bolus outlines similar septum in left mediastinum and might be called a left pleuroesophageal line.

ginning to notice the pleuroesophageal line and ince radiologists in the United States see only a portion of the chest roentgenograms, it is important o disseminate the information concerning this natomic landmark to all physicians rather than to he specializing group exclusively.

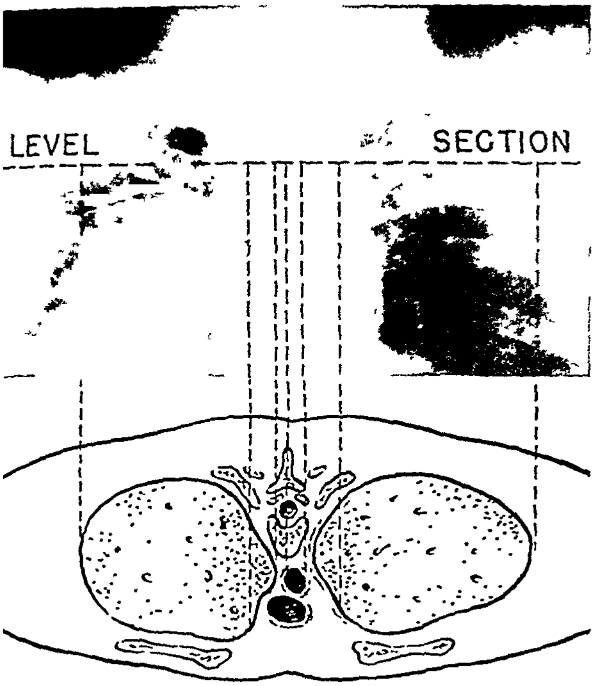

Fig. 2.—Oblique pleuroesophageal line shown in arc from ight second rib to aortic arch. Structures of upper thorax are iagrammed in schematic projection of cross-section to illusrate manner in which funnel-shaped air column in esophagus projects through trachea at this level, giving air contrast to esophageal margin of the pleuroesophageal line.

Cause of Pleuroesophageal Line

Most persons retain a small volume of air in the upper thoracic esophagus when they are standing or sitting erect. In this position the heart and the other heavy mediastinal structures are drawn downward so as to produce thinning of the upper mediastinum in its transverse diameter. This traction also produces a slight negative pressure in the upper esophagus that is usually neutralized by entry of a small amount of air. One will then observe in the posteroanterior (or anteroposterior) projection a continuous curved linear shadow of soft tissue density extending from the right apex downward across the second or third thoracic vertebra toward the aorta. Air contrast is present on both sides of the line, which varies from 3 mm. to 8 mm. in width. If air is not present in the esophagus, only the margin of air-filled right lung against the mediastinum can be seen.

Demonstration of Pleuroesophageal Line

In the upright position, the right margin of the adult esophagus lies in direct contact with the upper mediastinal pleura from the thoracic inlet to the azygos vein with only a small amount of muscle and loose connective tissue separating esophageal mucosa from the pleura. Figure 2 presents a diagrammatic cross-section of the upper mediastinum at the level of the pleuroesophageal line, indicating the projection of the two air-contrast margins that form the line when the esophagus contains air. In figure 3, spot films of the esophagus with use of air bolus and barium swallows demonstrate how the retained air, swallowed air, or barium suspension may outline the esophageal margin of the pleuroesophageal line. The air-filled lung provides air contrast against the pleura to form the other margin. This is confirmed in figure 4, which presents an oblique view of the upper esophagus and body section roentgenograms of the upper esophagus, illustrating how the right lung bulges behind the trachea against the thin septum composed of the esophageal wall, the visceral and parietal pleura, and the connective tissue between.

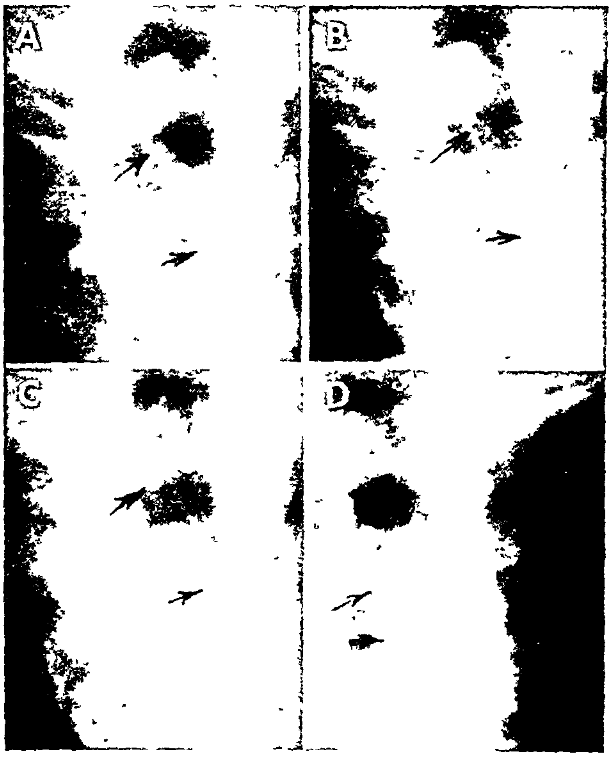

Fig. 3.—During fluoroscopy in upright position, particularly with an image amplifier, pleuroesophageal line may be recognized as elastic septum that responds to dynamics of intrathoracic and intraesophageal pressure changes. *A*, inspiration causes line to move downward toward right hilum. *B*, expiration moves it upward, "squeezing" air column in esophagus. *C*, normal swallow with air and barium mixed shows amount of air usually retained after barium bolus has passed. *D*, air bolus distends esophagus momentarily and lower part of pleuroesophageal line is displaced several millimeters to patient's right.

Cimmino, in 1956, presented 5 illustrations and a brief discussion of the "esophageal-pleural stripe."[1] This term seems unnecessarily complicated. Only two previous publications[2] have attempted to analyze the roentgenographic peculiarities of the upper mediastinum associated with linear markings and projected septums. None of these authors described the variations of the pleuroesophageal line as related to erect position, residual air bolus, swallowing, or respiratory dynamics. The significance of the air normally retained in the esophagus has not been appreciated. The Drs. Felson[3] illustrated and discussed the mechanism of air-tissue contrast in the projection of roentgenographic images of the mediastinal silhouette. This same mechanism determines whether there will be an image of the esophageal silhouette. The esophageal margins form no image unless the esophagus contains material more opaque or more radiolucent than the soft tissues of the upper mediastinum.

Figure 4*A* demonstrates a typical pleuroesophageal line with the esophageal margin formed by contrast of the residual air bolus in the upright esophagus. As the same patient moves into supine position, he becomes aware of the air and may belch or swallow. Several seconds later when the anteroposterior film of the upper mediastinum (fig. 4*B*) is exposed, there is no air to form an air contrast of the esophageal line. There is no line only the pleuromediastinal margin from th-

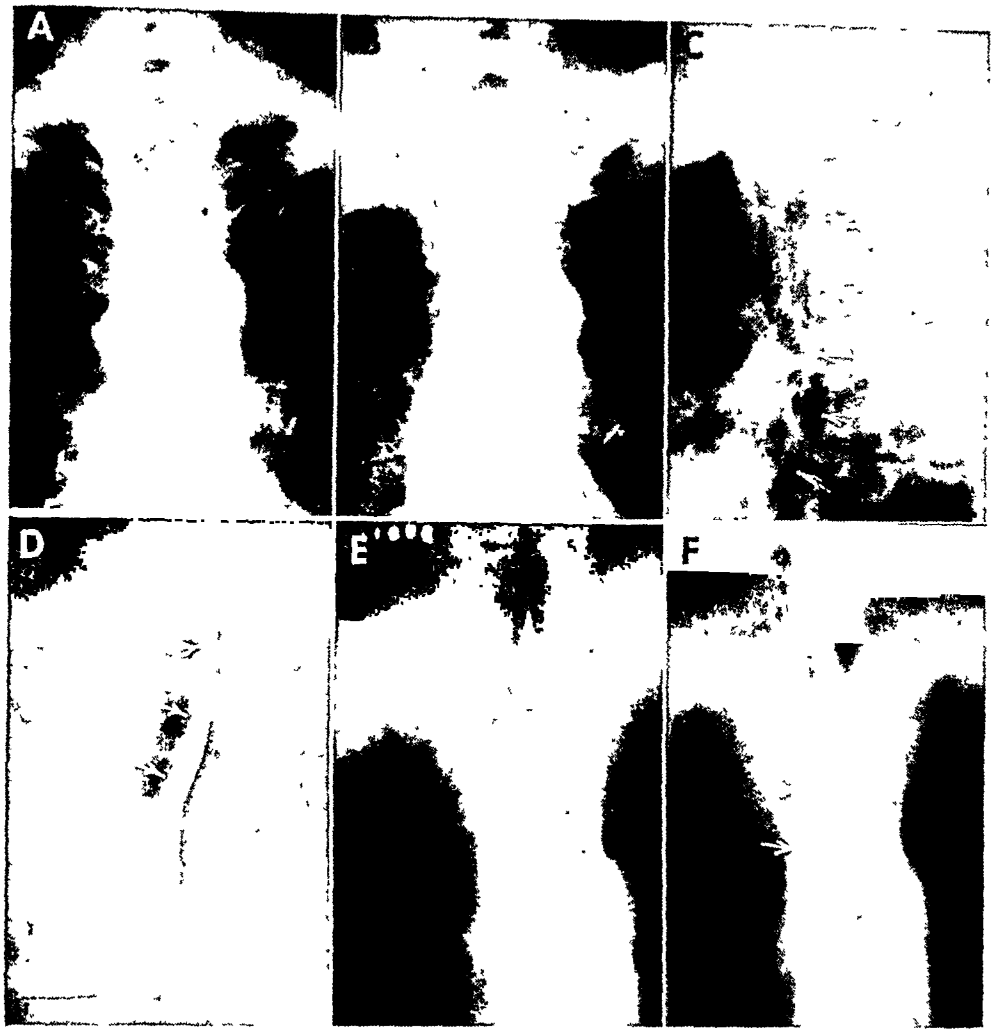

Fig. 4.—*A*, common configuration of pleuroesophageal line, representing septum of soft tissue sandwiched between two air-containing structures: right lung and upper esophagus. *B*, roentgenogram of same patient in supine position. Air in upper esophagus has been swallowed and now only margin or profile of right lung against upper mediastinum is visible through air-filled trachea. *C*, in lateral projection of chest, air may be seen in entire esophagus between spine and trachea if roentgenographic exposure is made while patient swallows or belches large air bolus. *D*, oblique projection of barium-filled esophagus demonstrates barium-contrasted pleuroesophageal line from apex of right lung to crossing of azygos vein. Line is more difficult to identify with air in esophagus. *E*, body section roentgenogram through level of upper esophagus shows apical segment of right upper lobe bulging behind trachea to form air contrast against posterior upper mediastinum. Visceral and parietal pleura, some connective tissue, and wall of esophagus separate air-filled lung from barium to form pleuroesophageal line. *F*, roentgenographic section 3 cm. anterior to esophagus shows pleurotracheal line, plane of tissues comprising tracheal wall, connective tissues, and layers of pleura.

thoracic inlet to the azygos vein is seen now. It would not be unreasonable to refer to this as the pleuroesophageal margin under these circumstances, although the esophagus actually takes no part in the formation of the image. When the patient is able to swallow air or belch during the exposure, some form of pleuroesophageal line can be identified in almost every adult and in most children. Many individuals will present bizarre configurations with large air bolus (fig. 1*D*, *E*, *F*). Air may be seen in the esophagus on lateral projection roentgenograms of the thorax if exposure is made during efforts to produce an intentional air bolus (fig. 4*C*).

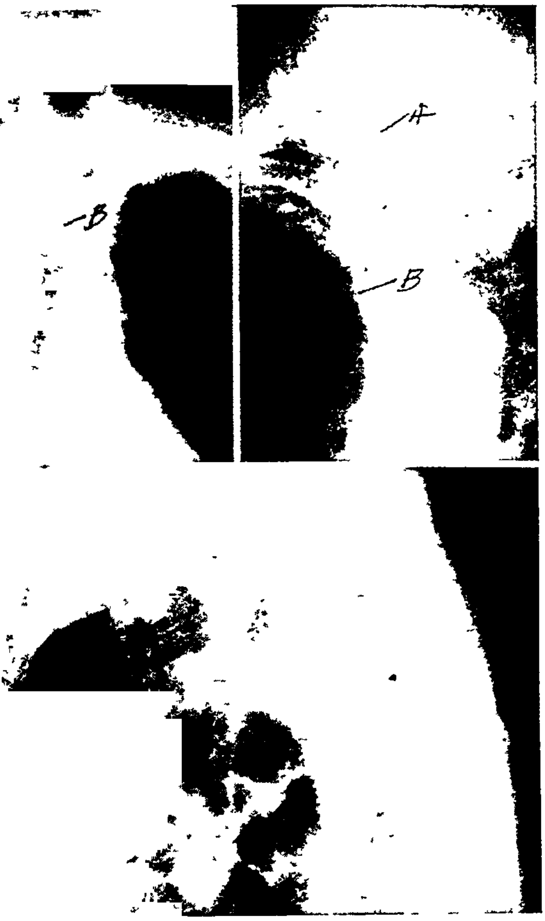

Fig. 5.—Emphysematous lungs producing bizarre septums and marginal contrasts in mediastinum. At point *B* in lordotic and posteroanterior projections is seen thin septum formed by approximated visceral and parietal pleura of right and left lungs. Almost all connective tissue has been displaced from anterior mediastinal space. At point *A* in posteroanterior film, pleuroesophageal margin can be identified, but absence of air in esophagus prevents projection of line. Difference between septate mediastinum and pleuroesophageal line is obvious. Point *C* in lateral projection represents sharp pleuroarterial margin where air-filled lung lies against innominate artery (if gas or opaque material filled artery pleuroarterial line would be seen).

Pathology and Normality

Persons with pulmonary emphysema often have strange linear patterns superimposed on the recognized structures of the mediastinum. The left lung and the right lung often become approximated anterior to the aorta and the innominate artery, displacing the soft connective tissues of the mediastinum until nothing remains in the anterior mediastinal space but a thin sagittal septum formed by the sandwich of pleura between the two lungs. The lungs also may become approximated behind the pulmonary artery. A pleuroesophageal margin is almost always seen, but air is usually absent from the upper thoracic esophagus because of the elevated intrathoracic pressure. The illustrations of figure 5 identify the anterior mediastinal septum formed by approximated emphysematous lungs at B. This eccentric curved line is easily located in both the lordotic and the posteroanterior projections. It is in no way related to the pleuroesophageal margin at point A. The lateral projection illustrated the projection of a sharp air-contrast margin of the anterior profile of the innominate artery because the lungs have replaced the areolar connective tissue that usually fills the anterior mediastinal space. It should be noted that this is considerably below the level at which the pleuroesophageal line is seen in the posteroanterior projection, and there is no reason to confuse the two. The pleuroesophageal line (or margin) carries no diagnostic implication of emphysema.

Conclusions

Although the pleuroesophageal line has no pathological or prognostic significance, it is obvious that the feature and the mechanism of its projection on the normal chest roentgenogram must become familiar to all who are responsible for interpretation of x-ray films. False association of the pleuroesophageal line with symptoms or suspected disease processes must be avoided. When its physiological significance is appreciated and one has became familiar with the normal variations, it is possible to use this landmark in the thorax for the study of real abnormalities of the thoracic inlet and the upper mediastinum.

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SKELETAL HEAD FRAME

A PRELIMINARY REPORT

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In the management of maxillofacial fractures, a skeletal head frame has been devised in an attempt to overcome usual immobilization disadvantages and to provide the necessary extraoral point of fixation frequently required. Placing the head frame takes about 15 minutes. All types of craniomaxillary injuries are amenable to treatment with this skeletal head frame.

Surgeons familiar with the treatment of maxillofacial fractures are aware of the inadequacy of the present method of plaster head caps in obtaining an extraoral point of fixation for reducing and immobilizing fractured bones.

Plaster Head Cap

Numerous appliances have been tried and all were found lacking in one or more ways. The plaster head cap (fig. 1) has been commonly used to provide an extraoral point of fixation. The discomforts of the patient and the complications that often arise from the use of plaster head caps have been detailed by Archer.[1] The following shortcomings are included: 1. It can never be rigidly stable, and it moves in direct proportion with the movement of the scalp. 2. When felt pads or sponge rubber are used over prominent bony areas of the skull, it is common for pressure necrosis in one or more areas to result under the plaster head cap. The more felt or rubber used in relief areas over bony prominences, the less stable is the plaster head cap. 3. Female patients are reluctant to have their hair cut off in preparation for the installation of a plaster head cap. 4. In hot weather, the plaster head cap can be extremely uncomfortable. Oral surgeons and patients frequently find the plaster head cap intolerable. Constant perspiration and unbearable itch precede fungus or secondary infection due to scratching. 5. The routinely applied plaster head cap, extending under the mastoids to take advantage of the undercuts, is bulky, and the patient invariably complains of its weight. 6. A plaster head cap cannot be used on patients with lacerations of the scalp or skull damage and brain injuries associated with fractures of the face. 7. Many patients with facial injuries also have fractured legs or abdominal injuries which make them bedfast. Plaster head caps are contraindicated in these cases because the patient moves his head and greater irritation to the scalp occurs. 8. Osteomyelitis of the skull has been reported after the use of the plaster head cap. Deepithelialized areas can and do result.

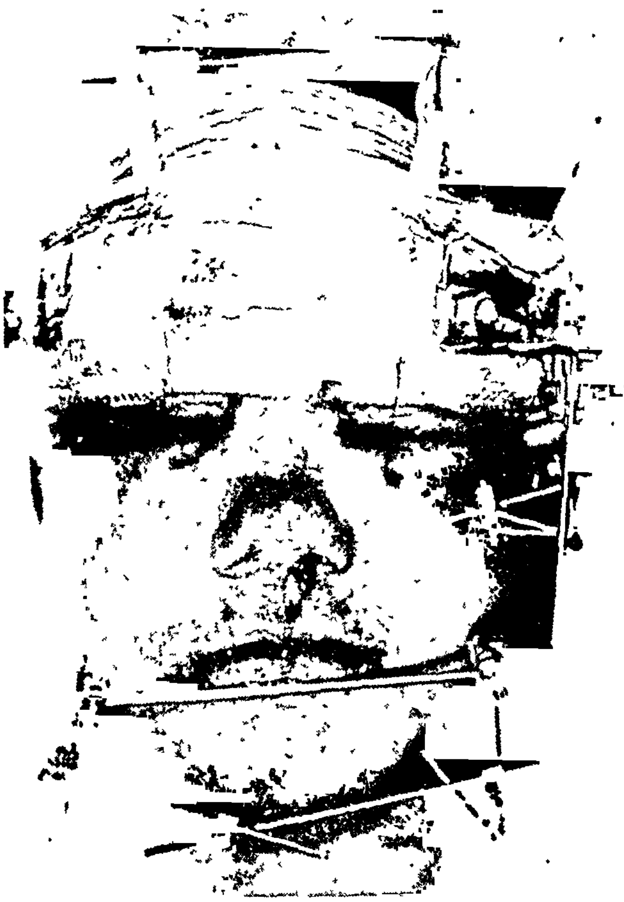

Fig. 1.—Front view of commonly used plaster head cap.

Skeletal Head Frame

In an attempt to overcome these disadvantages and to provide the necessary extraoral point of fixation frequently required in the management of maxillofacial fractures, the authors (an oral surgeon, a neurosurgeon, and a developmental engineer) designed a skeletal head frame which consists of an aluminum frame comprising three curved channel bars and finely turned, adjustable, stainless steel spade drills (fig. 2).

The appliance is held by a burrowing into the cortical bone, lamina externa, in the manner of Crutchfield tongs. Since the finely turned spade drill points readily pierce the scalp with gentle pressure, incisions are unnecessary. Two spade drills are driven into the temporal region on each side, and a pointed stabilizer, resting against the bone at the top center of the head, provides complete rigid stability. After the frame is placed, which takes less than 15 minutes, the patient is further prepared and draped routinely for the maxillofacial reduction. Roger Anderson pins are placed, and connecting bars are attached to the Roger Anderson appliance. Any other orthopedic, maxillofacial, wire, or neurosurgical device is similarly attached.

In a series of 15 cases the following advantages have been noted: 1. The spade drill points produce no abnormal roentgenographic changes. 2. The inherent tension of the frame prevents the spade drills from becoming loose. 3. The frame may be applied with general or local anesthesia over shampooed, short-clipped hair. 4. All patients were entirely free from pain and unpleasant sensations, because the periosteum was pierced when access to the cortical table was made. 5. The frame weighs oz., but, because of elimination of periosteal sensation, the patient is unaware of its weight. 6. None of the patients developed osteomyelitis. 7. The frame can be used additionally for traction in cervical spine fractures. 8. It can be used for measuring the parameters in stereotaxic neurosurgical procedures, such as chemopallidectomy. 9. The apparatus would appear to be ideal for mass casualty injuries in which the same individual sustains multiple maxillofacial and other fractures and cervical spine dislocation. 10. Even with skull fractures present, shifting the spade drill points to more rigid locations of the calvaria, and the frame is readily adaptable by virtue of the channel bar. 11. Débrided and sutured scalp lacerations do not complicate the use of the frame. 12. This appliance can be used for intranasal and extranasal splinting of fractures. 13. Bars attached to the frame may be used to retain compression dressings and ocular prosthesis.

The pins are stainless, shaped in the typical "spade drill" form, and have a shoulder about ⅛ in. from the point of the pin. Above the shoulder the pin has ringed grooves ⅛ in. apart, similar to Roger Anderson pins, to help gauge the penetration. When the shoulder of the drill point rests against the lamina externa of the skull, no further entry is permitted. The connecting bars running from the head frame to the fracture sites are of the same circumference as the Roger Anderson bars, so that the single wrench fits all of the nuts, increasing the versatility of the appliance.

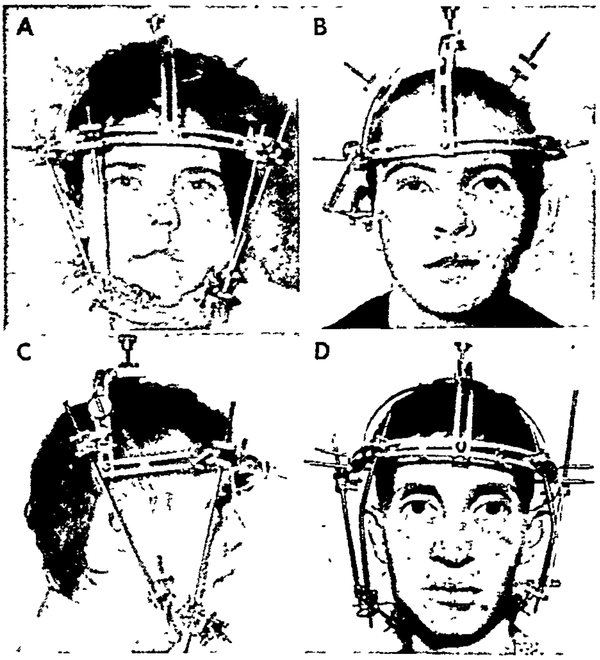

Fig. 2.—Skeletal head frame used in the following cases: *A*, maxillary and mandibular fractures; *B*, depressed zygoma, orbital floor fracture, infraorbital ridge fracture, and fracture of zygomatic arch; *C*, bone graft of bilateral, untreated mandibular fracture in edentulous patient; *D*, facial fractures with skull fracture.

We feel that a spectacular advance in extraoral fixation has been achieved in this device and that it represents a real milestone in the ever-advancing search for improved orthopedic maxillofacial and neurosurgical appliances.

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A MASS SOCIETY.—Today's society is seemingly dominated by what Riesman calls the "other-directed" man, who finds the motivations of his conduct and the end he pursues not in himself, but in the dictation of the group. An age of mass production and mass communication gives birth to a mass society, where the individual is as much standardized as are syndicated columns, TV shows and the products of industry. Few dare to be different, and for good reason—for to be different brings them under the condemnation of the group on whose opinion they form their own opinion of themselves. The idolatry of conformity, of being like everyone else in a group which tolerates only "marginal diversity"; the frenzy with which so many people addict themselves to all sorts of superficial activities or passivities—these and other enslavements of contemporary life originate, at least to some extent, from the need to replace beliefs and values and faith in which man once found security.— F. J. Braceland, M.D., Psychiatry and the Science of Man, Presidential Address, *The American Journal of Psychiatry*, July, 1957.

J.A.M.A., May 24, 1958

OPTIMUM AGE FOR SURGICAL CLOSURE OF PATENT DUCTUS ARTERIOSUS

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In order to determine the most favorable time for surgical closure of patent ductus arteriosus, the histories of 66 patients were reviewed. These patients had all been proved by cardiac catheterization, operation, or autopsy to have this condition as the sole cardiovascular anomaly. Three were not operated on. The other 63 were operated on without a death or any serious postoperative complications. Nearly half of the operations were done on patients under the age of 5 years. The data showed that postponing the operation beyond that age implied years of living with a severe handicap and with the danger of life-threatening complications such as heart failure, pulmonary hypertension, endarteritis, and degenerative vascular changes. After the age of 5 years the incidence of these complications increased sharply. Surgical division of the patent ductus provided a permanent cure. The authors recommend that in children under the age of 5 with symptoms of patent ductus arteriosus the closure be done as soon as the diagnosis is established, and that in children who are asymptomatic but known to have the condition the operation be done before the age of 5.

The optimum age for the surgical closure of a patent ductus arteriosus has not yet been clearly defined. A recent review of the combined experience of 49 surgeons with 3,896 patients who were operated on for this lesion suggests that the ideal time to recommend surgical intervention is when the patient is between 6 and 12 years of age unless signs of failure appear.[1] The fact that this policy may not serve the best interests of every patient is suggested by a recent evaluation of our experience with a group of infants and children with proved patent ductus arteriosus who have been cared for at the Columbus Children's Hospital during the past seven years. This analysis of our patients clearly shows that better management could have been afforded these patients by earlier correction of this common cardiovascular anomaly. As has been emphasized previously, deferment of surgical therapy may result in death for an infant whose condition is deteriorating solely from the effects of a patent ductus arteriosus. More often, however, such a delay leads to a continual pattern of growth failure and to recurrent refractory cardiopulmonary symptoms in younger children. Further procrastination exposes the older child to the risk of such serious complications as bacterial endarteritis, irreversible pulmonary hypertension, compromised myocardial reserve, and advanced pulmonary vascular degenerative changes. Familiarity with these facts has stimulated us to reexamine the objectives of the surgical management of this congenital defect and to attempt to define more lucidly the age range during which operation can be performed with maximum effectiveness.

Review of Patients

All patients who were admitted to the Columbus Children's Hospital during the period July, 1950, to June, 1957, who were proved by cardiac catheterization, operation, or autopsy to have a patent ductus arteriosus as the sole cardiovascular anomaly are included in this study. In all there were 66 patients meeting these criteria. Sixty-three of these children were operated on without a death or any serious postoperative complications. Nearly 50% were operated on before the age of 5 years. Eleven were operated on in the first 2 years of life, 19 between the ages of 2 and 5 years, and 33 between the ages of 5 and 16 years. In general the postoperative course was smoother in the younger patients, even though the majority of the infants showed serious symptoms, were grossly underweight, and often suffered from myocardial decompensation. The three patients on whom no operation was done must be considered therapeutic failures since two, although living (10 and 12 years of age), are considered inoperable because of reversal of their ductal shunts, while the third, an infant, died with his condition undiagnosed. These failures should be avoidable today, provided physicians are more cognizant of the manifestations of this disease in early life, make full use of the available diagnostic procedures, and recommend earlier surgical intervention.

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Manifestations of Patent Ductus Arteriosus

Cardiopulmonary symptoms were the commonest abnormalities observed and were present in 49 of the 66 infants and children included in this series. All of the infants were seriously ill at the time when they were admitted to this hospital. Each suffered from one or more of such symptoms as recurrent respiratory infection, inability to feed properly, and excessive irritability and fretfulness; each frequently was noted by his parents to have shortness of breath, tachypnea, and a rapid, forceful heartbeat. Thirty-seven of the 54 children who were over 2 years of age were observed to have exertional dyspnea, easy fatigability, or recurring respiratory infections which required frequent medical attention. Individually and collectively these patients presented a total morbidity, due to their altered cardiorespiratory physiology, that is certainly not inconsequential (fig. 1).

Growth and Development

Thirty-four of the 66 patients, including all 12 of the infants, fell below the 10th percentile curve on a Boston Children's Medical Center anthropometric chart for weight. One infant 2 months of age weighed less than his birth weight at the time of operation. Failure to gain normally was less frequently observed in the older children, although 22 of the 54 patients who were more than 2 and less than 16 years of age also fell below the 10th percentile. The significance of the preoperative evaluation of the weight was enhanced by the postoperative increase in percentile for weight shown by 20 children whose weight was followed from one to five years after operation. In these 20 for whom follow-up information was available, the median percentile for weight was 10 preoperatively and 65 postoperatively. Ten of the 11 patients who fell on or below the 10th percentile curve preoperatively rose above the 30th percentile postoperatively (fig. 2).

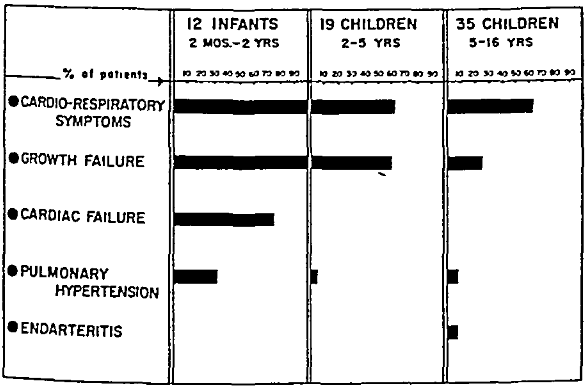

Fig. 1.—Manifestations of patent ductus arteriosus.

Complications Which Threaten Life

The serious complications of a patent ductus arteriosus are by no means limited to the patients in the older age group. Heart failure, pulmonary hypertension, acute and subacute endarteritis, and pulmonary vascular degenerative disease can and do occur in children.

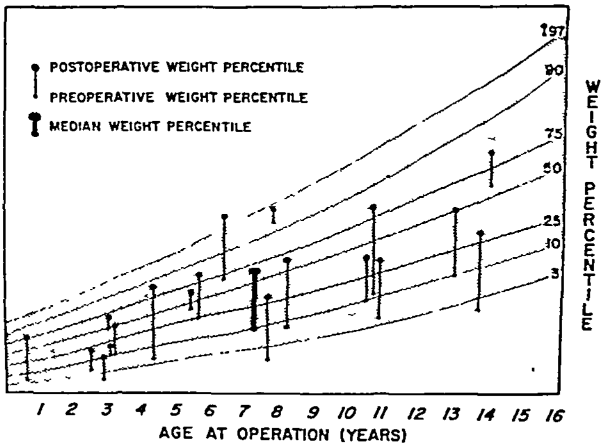

Fig. 2.—Weight change observed in 20 children after division of patent ductus arteriosus (adapted from Boston Children's Hospital anthropometric chart for weight).

Heart Failure.—Nine of the 12 infants in this series showed definite evidence of cardiac decompensation at the time they were admitted to the hospital for diagnosis and treatment. After a brief period of medical management eight of these infants were successfully operated on, while the remaining infant died with no diagnosis given. None of the older children in this series were in heart failure.

Pulmonary Hypertension.—Pulmonary arterial hypertension, with blood pressure ranging from 40/25 to 140/80 mm. Hg, was present in 8 of 10 patients who underwent cardiac catheterization. Four of these patients were less than 2 years of age, and three patients with pulmonary artery pressures equal to or greater than systemic arterial pressures were 10, 12, and 14 years of age. All four of the infants with pulmonary hypertension were in cardiac failure. Only one of the three older children, a 14-year-old boy who had a balanced flow through his ductus, was deemed amenable to surgical treatment. The two remaining older children, aged 10 and 12, already had evidence of reversed flow through the ductus during the cardiac cycle and were deemed to be inoperable. The ductus was divided without incident in all other patients with pulmonary hypertension.

Endarteritis.—Three children, all of whom were over 5 years of age, developed bacterial endarteritis, which [illegible] by blood culture studies in each [illegible] ccus [illegible] oniae, Streptococcu[illegible] ogenes var. aureus were the causative organisms in the respective patients. Each child was critically ill and one developed multiple septic pulmonary emboli during the course of this illness. All three patients responded satisfactorily to treatment with large doses of penicillin given intravenously, and the ductus was successfully divided four to six weeks after the blood culture tests had reverted to negative.

Degenerative Vascular Changes.—There were no cases of such gross degenerative vascular changes as pulmonary or ductal aneurysm, and the peripheral lung biopsies, which were obtained in several instances, showed no histological abnormalities.

Comment

Physicians agree that when a persistently patent ductus arteriosus exists as an isolated congenital cardiovascular defect it should be surgically closed sometime during childhood. The operation is safe and, when the ductus is divided, provides a permanent cure. The mortality rate which attends this procedure is as low in infants as in children. Analysis of those reports in the literature where the result by age is clearly stated shows that the mortality was 1.1% in 91 infants less than 2 years of age and 1.3% in 378 young children less than 5 years of age, as compared with a mortality of 1.5% in 480 children 5 to 16 years of age (table 1). Although the differences are not statistically significant, these results are particularly impressive when one considers that most of the infants were seriously ill, often with cardiac decompensation, when the operation was performed, whereas the majority of the older patients were relatively asymptomatic. There is little question, therefore, that the obliteration of a patent ductus can be safely carried out in any age group. The determining factor in choosing the optimum time for surgical intervention need not be dictated by the operative mortality but rather by the expected morbidity and mortality that attends the disease itself.

Table 1.—*Summary of 949 Cases Where Results by Age After Operation for Patent Ductus Arteriosus Are Clearly Stated*

	Age, Yr.*					
	<2		<5		5-16	
References	Cases, No.	Deaths, No.	Cases, No.	Deaths, No.	Cases, No.	Deaths, No.
Jones, J. C.: J. Thoracic Surg. 16:305, 1947	...	...	17	0	28	2
Gross and Longino[7]	...	...	101	4	213	3
Ziegler[2]	8	1	19	1	...	...
Adams and others[3]	15	0	15	0	...	...
Holman and others[6]	5	0	30	0	33	1
Lyon and Kaplan[13]	4	0	4	0	...	...
Ash, R., and Fischer, D.: Pediatrics 16:695, 1955	21	0	93	0	39	0
Hay J. D., and Ward, O.C.: Arch. Dis. Childhood 31:279, 1956	3	0	32	0	74	1
Glenn, W. W. L., and others: Ann. Surg. 143:471, 1956	6	0	37	0	60	0
Bauersfeld, S. R., and others: J. Thoracic Surg. 33:123, 1957	18	0	...	...	...	...
Clatworthy and McDonald, 1957	11	0	30	0	33	0
Totals	91	1	378	5	480	7

* At 2 years the mortality was 1.1, at 5 1.3, and at 5 to 16 years 1.5%. The overall mortality of the 949 patients, under 16 years of age, was 1.4%

A large, functionally patent ductus arteriosus may destroy the very young. Ziegler[2] and Adams and associates[3] have stressed the clinical features of this lesion as it is seen in infants and have emphasized the importance of establishing the diagnosis and proceeding with the closure of the ductus without delay in any infant who shows symptoms. Fortunately the majority of patients do not get into serious difficulty during infancy, but they do experience a considerable morbidity from cardiopulmonary manifestations and physical retardation during childhood. There is little justification for permitting even these minor abnormalities to persist, since they nearly always disappear after closure of the ductus. Adams and Forsyth[4] followed the weights of patients after repair of the ductus and concluded that the rate of growth and the attainment of physical potential were diminished when surgery was performed on patients in late childhood.

With rare exception, all patients with this anomaly who survive infancy and early childhood are exposed to the risk of such complications as superimposed infection, irreversible pulmonary hypertension, and vascular degenerative changes, and after the patient reaches the age of 5 years the incidence of these complications increases sharply.

Although bacterial endarteritis is a particularly feared complication in adults, there has been little written about its occurrence in children. Hubbard and associates[5] in a collected review of 39 cases have found eight instances of endarteritis that occurred in children all of whom were over 6 years of age. Holman and associates[6] reported four cases which occurred when the children were between the ages of 7 and 11 years. The youngest reported patient with endarteritis was 4 years of age.[7] Although better medical management with antibiotics has reduced the mortality of endarteritis, the prevention of this serious complication is best accomplished by the surgical closure of the ductus before the patient reaches the age of 5 years, since infection rarely occurs prior to this time.

Pulmonary arterial hypertension associated with patency of the ductus arteriosus has been observed in patients of all ages. Dammann and Ferencz[8] have shown that the extremely high pulmonary arterial pressures may be well tolerated by young individuals but that the disease is a progressive one and ultimately leads to the premature death of the patient, with myocardial decompensation and/or reversal of blood flow through the ductus. Anderson[9] has carefully studied 10 children with reversed flow and concluded that the reversal of flow in the ductus does not always represent the end-result of prolonged elevated pressure but may exist even in early infancy. Fortunately, young individuals with severe pulmonary hypertension tolerate closure of their shunt much better than do older children or adults.[10] In a selected series of patients with proved pulmonary hypertension (table 2) the mortality was 0 in 22 infants under 2 years of age and 10.5% in 19 younger children between the ages of 2 and 5, as compared with 26.7% in 15 patients between 5 and 16 years of age. These statistically significant differences in the operative risk are presumably due to the fact that the myocardial reserve of the patients is excellent and suggest that the pulmonary vascular resistance has not become fixed in the younger patients.

The pulmonary vascular degenerative changes are of two types. The first and most commonly encountered include those which are confined to the smaller pulmonary arterial vessels initially and include hypertrophy of the media and proliferation of the intimal layer. Medial hypertrophy of the pulmonary arteries is present in the normal human fetus and in the presence of an open ductus may persist into early infancy.[11] When the ductal shunt either closes normally or is obliterated surgically, hypertrophy of the medial layer apparently regresses and the vascular resistance presumably returns to normal. However, if the shunt remains open the pulmonary vasculature is subjected to prolonged increases in flow, pulse, and pressure, and the intimal proliferation progresses to sclerosis and thrombosis and eventual obliteration of the lumen, with concomitant increase in pulmonary vascular resistance, which ultimately becomes fixed and irreversible.[9]

The second but less common vascular degenerative change involves the ductus itself, the pulmonary artery, or the adjacent aorta. Lindert and Correll[12] collected 29 patients with aneurysm of these major vascular channels, the youngest of whom was over 5 years of age. Two of these patients died after a rupture of the aneurysm at 5 and 12 years of age. Holman[6] encountered one patient, 11 years of age, with an aneurysm of the ductus and another 14 years of age with a pulmonary arterial aneurysm. The youngest patient with aneurysm whom we have encountered in our review is one reported by Lyon and Kaplan[13]—an infant 27 days of age who died after thrombosis of a ductal aneurysm, and this condition was complicated by renal arterial thrombosis.

Disadvantages of Early Operation.—The disadvantages of early operation appear to be relatively negligible in the face of all of the evidence previously presented. Obviously, facilities and personnel capable of caring for infants and younger children must be utilized and fortunately are now widely available. Emotional problems are commonly encountered in children between 2 and 4 years of age, but in general can be dealt with judiciously by careful preparation of the family and the child prior to his admission to the hospital and by concern for his mental as well as physical requirements while he is incapacitated in this strange environment.

Conclusions

Surgical closure of a patent ductus arteriosus should be carried out on any child who shows symptoms as early as the diagnosis is established and in asymptomatic patients before they reach the age of 5 years. The operative morbidity and mortality in infants and younger children, as far as we can determine, is no greater than that experienced in older children. Failure to eradicate this lesion in early life may expose the infant with symptoms to progressive myocardial decompensation and the young child to the needless threat of cardiorespiratory disability, growth failure which may not be entirely reversible, and to such additional serious complications as endarteritis, irreversible pulmonary hypertension, and degenerative disease of the major and minor pulmonary vessels.

TABLE 2.—*Cases of Patent Ductus Arteriosus Selected Because of Proved Pulmonary Hypertension*

	Age, Yr.*					
	2		5		5-16	
References	Cases, No.	Deaths, No.	Cases, No.	Deaths, No.	Cases, No.	Deaths, No.
Damman, J. F., and Sell, C. G. R.: Circulation 6:110, 1952	3	0	11	1	4	1
Ziegler[2]	6	0	2	0	...	...
Adams and others[3]	4	0	...	...	...	...
Ellis, F. F., and others J. Thoracic Surg. 31:268, 1956	3	0	1	0	6 2†	1†
Anderson and others[9]	1†	0	1†	1†	1†	1†
Hay, J. D., and Ward, O. C.: Arch. Dis. Childhood 31:279, 1956	1	0	3	0	3 1†	1†
Clatworthy and McDonald, 1957	4	0	1	0	1	0
Totals	22	0	19	2	15	4

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* At 2 years the mortality was 0, at 2 to 5 years 10.5%, and at 5 to 16 years 26.7%. The over-all mortality of the 56 patients was 10.7%.

† No. with reversal of flow.

17th Street at Livingston Park (5) (Dr. Clatworthy).

This study was supported by the Children's Hospital Investigative Laboratory Division and the Central Ohio Heart Association.

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SYMPATHY AND EMPATHY

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The person able to determine his emotional boundaries, that is, where he leaves off and where someone else begins, and not indulge in the other's emotional problems, functions more usefully, happily, and gracefully. It appears that one of the most difficult tasks put upon man is the reflective (not reflexive) commitment of oneself to another's problem, while each maintains his own identity. It is a state to which those in the interviewing professions should aspire. Though this is a proposition well known to psychology and psychiatry, it is rarely if ever considered in schools at any level. It follows that if we acquire this important talent by learning, we learn it later than we should. It ought to be possible to bring people to reflective commitment earlier and more gracefully than heretofore has been the case. It is likely that, if one has been strongly conditioned in youth to direction by the feelings of others (outer-directed is Riesman's term for it), this will later become almost a reflex. An emotional discharge by another then becomes a challenge. The ways in which one person may react to another are infinite; there is a spectrum of these reactions. In these exchanges it is quite unusual to witness reflective commitment and behavior predicated rather completely on what is happening now. Yet to the extent that this does not operate we are not free, an uneasy state of affairs to be sure. Old and established patterns much too often interfere with current functioning.

The act or capacity of entering into or sharing the feelings of another is known as sympathy. Empathy, on the other hand, not only is an identification of sorts but also connotes an awareness of one's separateness from the observed. One of the most difficult tasks put upon man is reflective commitment to another's problem while maintaining his own identity. The ways in which one person may react to another are infinite. A subtle and significant feature of a happy medical practice is to remain unencumbered by the patient's problem.

Thus conscience does make cowards of us all;
And thus the native hue of resolution
Is sicklied o'er with the pale cast of thought,
And enterprises of great pith and moment
With this regard their currents turn awry,
And lose the name of action.
Hamlet III. i. 56

To psychiatrists this is elementary; when a person has not matured emotionally, stimuli often evoke unrealistic behavioral patterns. People repeat themselves endlessly as though they had been hypnotized at some tender age and told that henceforth this is the way it was to be. The basic behavior of a person is largely unchanging, barring catastrophe or another moving emotional experience.

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This repetition presents in various guises which remove the phenomenon from the realm of the obvious. It has been said of a person so hampered that "he has been 'taken in' so to speak by what he has taken in."[1]

Medical students and physicians do not escape this blight; behavior in others is apt to draw them into activity which they neither originated nor had any intention of entering into. The possibilities are varied and infinite, limited only by the energy that is available; waning energy may be a factor in the amelioration of such participation as we grow older. Physicians are doubly burdened when they are unable to unravel the meaning of such behavior in others, since so much that is constructive in therapy depends upon its recognition. It usually has not been possible for teachers to assist students toward enlightenment in this area. Indeed it is unlikely that most teachers, at least in schools of medicine, would consider this their function or responsibility. Whatever the case, I will point to some areas wherein impasses frequently develop in an interviewing profession such as medicine.

Many teachers of medicine advise the sympathetic approach; one cannot fully appreciate the problems of others, it has been said, unless he can put himself in another's place. We ought to consider exactly what we mean by this sympathy. On casual glance, sympathy would seem to be a quality devoutly to be wished for in the practice of medicine. Certainly most of us entered our profession with some such thinking; the sympathetic physician has been portrayed with persistence through the ages. As is often the case, the judicious use of a good dictionary may give us a hint as to what may be the matter with one or another cherished belief. If we thoughtfully examine the definition of the word sympathy, we find that it refers to an affinity, association, or relationship so that whatever affects one, similarly affects the other. The act or capacity of entering into or sharing the feelings of another is known as sympathy. Without crowding the definition we may say that this describes exactly what occurs in far too many human relationships, including the practice of medicine. I want to submit that entering into the feelings of another and becoming similarly affected may not be the constructive method that it has been supposed. There are so many examples of this affinity that it is difficult to know which to cite; the patient demands subtly or crudely and the physician either falls in with the demand or becomes annoyed; the patient prefers another medical advisor and the physician is hurt; or the patient becomes glad, mad, or sad or even amorous and the physician follows suit, and so on ad infinitum. It would seem as if the one affects the other similarly to his own feelings, surely restricting movement in him who is supposed to be acting maturely, unhamperedly, and realistically according to what is transpiring in the here and now. The doctor then "feeds back" problems as complex if not more so than those his patient brought to him, and energy is invested where it is wasted. We should become aware of the subtle deterioration of our usefulness in such situations. It is no longer the best medicine to proceed blindly motivated by humaneness; there has been developed a better way. Action motivated by conscious awareness is one of the main goals of today's psychiatrist.

The student of medicine rarely has the opportunity to learn about the great advantages that accrue to maintaining one's own personality in any emotional climate. The patient should be allowed his own problems without a need on the part of the physician to partake of them. This is the attitude best encompassed by the psychological term, empathy. The term empathy is thought to have originated with the German psychologist, Theodore Lipps, in the word einfühlung. Like many foreign conglomerates, einfühlung is difficult of translation. Einfühlung connotes the emotional appreciation of another's feelings, as does sympathy. Einfühlung, or empathy as we say, is an entrance into the feelings of another person or of a thing or concept; one may feel oneself into things contemplated or persons observed. This "in-feeling," or better "feeling-into," depends a good deal on the richness of one's own experience; it has to do with the matured use of the self. It is not only an identification of sorts, but unlike the implications of sympathy it is an awareness of one's separateness from the observed. One has had one's own feelings and relationships and has worked at the understanding of them, and they will be useful in understanding those feelings and relationships of others. Appreciation of another's feelings and problems is quite different from joining in them, and in so doing, complicating them beyond resolving. Empathetic understanding allows a better opportunity of defining what is transpiring and what the behavior of another signifies. It is hardly possible to overstate the importance of the uses of empathy in the practice of medicine.

What has been said so far may appear to give license to reticence in engaging the patient's main problems and to a passive or indifferent or lazy attitude of withdrawal on the part of the physician. This is about as far as it would be possible to get from the correct interpretation. Rather, the goal is to allow the physician the maximum freedom of movement so that he may act for the greatest benefit of the patient. One of the very greatest assets in the physician's possession is freedom of movement, and this may pertain only if the physician remains apart from the enervating morass of the patient's problems, viewing them detachedly yet interestedly. It might be said quite simply that one cannot become interested in them short of being interested, a state that only the very greatest doctors achieve consistently. But we cannot hope to be of maximum help to the patient if we become subjective about the trouble and, therefore, partake of it. This is the main reason why the physician does not treat his own family.

I now want to turn to a few examples. We all know patients who constantly pick at us, in the provocative fashion of a youngster who is *itching* for a licking. They probe for the "soft spots"; usually they are burdened and uneasy people. By implication or even by direction they indicate that the physician does not know his business, or at the very least that he is doing them no good. Obviously we must be on firm ground in dealing with these persons as with all patients; one can never operate from a base of inadequate knowledge and expect to function as a first-rate physician. The basis of security in this regard is the thorough examination, for which there is absolutely no substitute. But indifferent technique or lack of knowledge is not the problem under consideration here. More often the physician is unable to withstand the patient's provocations mainly because of his own unmastered conflicts. He mistakes the patient's problem as his own; he picks up the emotional challenge and finds himself acting in a fashion suggested by the conduct of the patient. Clearly then he is being *outer-directed*.

Perhaps one of the most obvious examples of this outer-direction is the conduct of many physicians in their dealings with persons with dependency problems. These persons, in their contact with authority, repeat their unmastered emotional problems in such a way as frequently enough stirs the doctor to thinly disguised and even overt hostility. *This destructive approach*—of both participants I might say—is seen too often when the patient is receiving compensation for illness, and particularly compensation from public funds. Patients are hardly aware of the danger inherent in this position, or I do not believe they would *cultivate it as often as* they do.[2] Here the doctor is *involved sympathetically*; there is an affinity, association, or relationship with the patient, so that whatever affects one (the patient) similarly affects the other (the physician). This *affinity* impedes effectiveness, and the physician then proceeds haltingly and usually *is* blocked from performing the work he should be doing. Most physicians would rationalize this behavior as moral, perhaps noting that they reserve a full measure only for the deserving. As Cervantes said, it is the hardest job in the world to know oneself. With a bit of good-humored self-examination, it is readily understood that everyone has quite legitimately a longing to be taken care of; this is elemental in *protoplasm*. The dependen state was originally the privilege of all of us an no one of us budged from it with grace. There ever the pull to return to the "good old days," an who has not experienced these nostalgic longings Though we are prone to deny it, people who r ceive compensation for illness poorly understoo —as an example, the neuroses—arouse in us an env of sorts. When the reward is obtained from th "public trough"—some indication of piggishness we are touched to the quick. This represents a kin of *nirvana*, a state we have longed for since w were too rudely removed from it, an unconsciou longing to be sure, but more moving by reaso thereof. So we transcend our medical competenc to judge these sick people, *and the more we judg* the more we may be judged, since the emotiona *state which we deride with such vigor is* that fo *which we long. As Shakespeare* put it: "The lad doth protest too much, methinks."

Szasz[3] has published an interesting treatise concerning the physician's concept of malingerin which bears on our problem. There is an old sayin *taken from Spinoza, as I remember*, to the effec that Paul's idea of Peter tells us more about Pau than about Peter. A diagnosis of malingering expresses nothing so much as the physician's mora condemnation of the patient, and it tells us as much if not more, about the physician than it does abou the patient. With it the physician becomes dragooned into the role of an umpire; *then it becomes* his duty to see that no one cheats. Obviously medical training is not intended to make one expert as an umpire; perhaps the least that may be said against a diagnosis of "malingering" is that it draws the doctor away from his competence. The inferences are clear; one cannot allow oneself to be drawn sympathetically into activity that intellect ought to have warned is not within the purview of medical expertness. It should be obvious that patients who have been called *malingerers* are sick people, and it is our duty to find out why and what might be done toward remedy, and *nothing more*.

The temptation to transcend the boundaries of competence is a *continuing* one to men of medicine. If there were time it would be interesting to try to determine why this is so. *Currently the need* for authorities is very great indeed; the physician may find his opinion being sought in practically any problem that besets a human being. We are reminded *about the old family* doctor who—sainted and enshrined by death and distance—had his opinion asked in such things as *investments, politics*, and all sorts and conditions of behavior. The wise physician guards against any anachronism, and particularly this continuing temptation which may represent nothing *more than* the patient's attempt to cast him in the role *of the* all-giving father; a role than which, although flattering, there is none more difficult in the world to maintain with consistency.

In this regard I am reminded of the many legalisms that somehow have been extended into medicine, for example, the terms insanity, per-cent-disability, and the irresistible impulse (I am taken with Justice Brandeis' remark that the irresistible is often only that which is not resisted). It is as though others, surveying the field of medicine and finding it not entirely to their liking, decided that the game was going to be played on different terms and then projected regulations with which they felt more at ease. The physician who plays the game away from his home base, away from his own unique competence, is in trouble. The best antidote for this temptation is self-examination, with attention to the concepts of sympathy and empathy as they have been developed here.

A group of patients who test our powers to act as an independent and inner-directed unit are those with emotional illnesses and particularly those whose problems are subtle and disguised, as may be the case in some conversion states and in masked depressions. So, too, with any complex illness where the diagnosis is difficult, and particularly when a deal of continuing pain is involved. These patients unmask our emotional inadequacy no less than the compensation cases. Knowledge is never complete, and those physicians in the thick of it must always handle a modicum of insoluble problems. This is no threat to those who have matured to the point of admitting to themselves that there are some things they can't know, even after thorough study. Kant's definition of faith applies here: "Again and again it is necessary to take a decision on the basis of knowledge sufficient for action but insufficient to satisfy the intellect." Not to know is a threat to a hampered personality, as it is to admit that there may be others whose competence extends into realms where he himself is not particularly interested. To obstruct treatment for a person who functions poorly for any cause, is surely to be "sucked in" and immobilized by the patient's problem. This is sympathizing rather than empathizing, an affinity or relationship so that whatever affects one, similarly affects the other.

Most of these people are in need of a steadfast and ongoing relationship, although some of them are even more in need of a thorough physical examination and a proper diagnosis. The physician may not be in a position to afford a continuing relationship to such persons for any of a number of reasons; frequently he hasn't the time to devote to it that they require. However, he may not be aware of his fear of it; when his tokens of relationship—namely pills and palaver—run out, he is in a sense bankrupt. He has no faith in relationship therapy, I suspect mainly because he does not know how to maintain his integrity in it. I don't mean this in any moral sense; I mean integrity from the standpoint of an independently functioning, secure, innerly directed, and well-integrated, singular unit.

The patient presumes him to be an expert and presents himself for treatment. The physician falls in with the patient's feeling; he sympathizes with the patient to the extent that he agrees that he is such an expert as the patient decrees him to be. He then pronounces him to have no illness with the usual phrasing: "There's nothing the matter with you." Into such travesties can our sympathies lead us! An empathetic physician might well say: "I know or I will find out about the trouble that you describe and I will work with you concerning it," or "I will send you to someone who does this type of work."

Another problem in this category is the pain sometimes suffered because of the resistance to giving analgesic drugs oftener than every two to four hours or so, and in no more than the usual dose. This applies particularly to patients who suffer from a fatal illness. I can make nothing of this problem unless it be another example in the realm that I have been discussing. Obviously addiction is not a consideration in this regard, certainly expense is not, and there is no danger of euthanasia, parenthetically a procedure in which I have no faith. I cannot see how the clock—that is, the movement of the earth on its axis—can have anything to do with the care of persons dying with excruciating pain. The main problem is to keep such people as comfortable as it is within our province to do, and besides giving of oneself this involves the proper use of more than the usual doses of potent analgesics in addition to nursing care and to comforting the family. If we are being subtly hampered in this endeavor it behooves us to find out why.

There is a concept of purification by suffering. But in our culture this punishment usually has been reserved for the criminal. One may presume that everyone is guilty, as some do, but this is an uneasy base from which to practice medicine, since once again this is beyond the province of our competence. It seems likely that here again we have become enmeshed by feelings of which we are unaware, and particularly those having to do with dependency. In an ongoing relationship it is difficult to be constantly gratifying the dependency feelings of others without garnering something in the way of emotional supplies in return. Perhaps this is where we fail, when we do, in the handling of chronic disease. Everyone finds it difficult to constantly give of his substance without receiving in return. The usual method to get around this has been to file these people away from the stream of medical consciousness; up until recently most hospitals for the chronically ill were miles away from medical centers. There are, of course, many other reasons. But nothing but good can accrue to becoming aware of our own feelings as regards problems such as these. The best that derives therefrom is the freedom to act realistically and according to the current happenings.

A subtle and significant feature of a happy medical practice is to remain unencumbered by the patient's problem. Among others to point this up, particularly as far as fear is concerned, has been Wilmer[4] in his work with psychotic patients. Noting the experience of certain English psychiatric institutions where the staff expect the patients to control their own aggressive impulses, he operated a therapeutic community in a ward where all patients were free to move about and were expected to attend daily meetings. These meetings were followed by a staff conference. Both the staff's and patients' anxieties and interpersonal relationships were kept under constant scrutiny and study. An examination of the personal fears of physicians and other ward personnel was paramount in the scheme. A ward previously disturbed was thereby changed into a ward without restraint, the use of parenteral sedation was eliminated, and the amount of oral sedation was greatly diminished. It is not only on psychiatric wards that too much chemical and physical restraint has been used; there seems to have gotten around the idea that the quieter patient is the "good" patient. Restraints of all sorts and tubes from all orifices have become the order of the day. Without doubt this has something to do with the paucity of hospital personnel, but also there is some misunderstanding of their own motivations by that personnel.

These illustrations should suffice to point up the constructive value of empathy and the sometimes disorganizing effect of sympathy. Obviously it requires more than an understanding of the definition of words to become the good physician. But it helps to know even this much and a start must be made somewhere. The ability to be empathetic depends largely on the richness of one's own emotional experiences. These experiences are the basis of inner perception—intuition, as it is sometimes termed—the ability to understand one's own feelings and relationships, and by reason thereof, those of others. There is no substitute for knowing, and there is no knowing so useful as the knowledge of oneself. While this is meant in its broadest sense, the most important aspect of this knowing is the relaxed and confident use of one's own feelings. In this vein it is worth remarking how useful may be the symptoms that one has personally experienced in the handling of those of his patients. I have sometimes caught myself wondering if it might not be useful for physicians, nurses, and other hospital and clinic personnel to be ill periodically, to add to their understanding of the problems of patients.

In our culture we operate mainly from an intellectual base. In most circles knowing is still considered to be a conscious phenomenon, entirely dominated by intellect. We all know how we need to go to the books with great frequency in youth. Some of us never learn to trust our feelings or experience in dealing with problems as they arise, and there then must always be an authority outside oneself. This, at least in a degree, must reflect the conditioning that one has been exposed to in childhood.

In any case I consider it helpful to know intellectually the difference between sympathy and empathy and some of the implications thereof. Just this much may save the physician from acting in a manner suggesting that he himself imposed the disease on his patient and, while it should never lift him in any sense above the misery and suffering, it may allow him a certain freedom to act for the patient's greatest good. The ultimate test of any medical endeavor is what it does for the patient. The doctor proceeding bravely and courageously, to say nothing of good-humoredly, continuing to learn about himself and his own problems will be good for the patient.

Truth is within ourselves; it takes no rise
From outward things, whate'er you may believe.
There is an inmost centre in us all,
Where truth abides in fullness; and around,
Wall within wall, the gross flesh hems it in,
This perfect, clear perception—which is truth.
A baffling and perverting carnal mesh
Binds it, and makes all error: and, to KNOW,
Rather consists in opening out a way
Whence the imprisoned splendor may dart forth,
Than in effecting entry for the light
Supposed to be without.

Paracelsus—Robert Browning

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CLINICAL NOTES

A SIMPLE TEST FOR MYOHEMOGLOBINURIA (MYOGLOBINURIA)

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Like other rare diseases, myohemoglobinuria [1] (myoglobinuria) is believed to occur more often han the sparse number of reported cases (about 35) would indicate. Even when the diagnosis of myohemoglobinuria is entertained, it is difficult to disinguish between myohemoglobinuria and hemoglobinuria, a much more frequent condition. This differentiation until recently has required the use of a highly precise and carefully calibrated spectrophotometer usually found only in research laboraories. Even with such an instrument, and with both pure myohemoglobin (myoglobin) and hemoglobin saturated with carbon monoxide available for control determinations, differentiation is difficult since it depends on small differences in the position of spectral bands.[2] It has recently been uggested that, with a fluorescent lamp as a source of light, the hand spectroscope may be used to dentify myohemoglobin.[3] Also, in one case, paper electrophoresis has been used to diagnose myohemoglobinuria.[4] A simple chemical method for differentiating between myohemoglobinuria and hemoglobinuria is presented below.

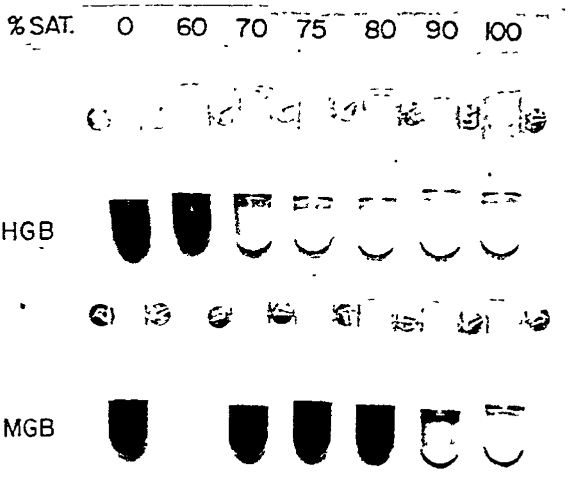
Technique

First, the abnormal pigment, which is red in reshly voided urine (myohemoglobin) but turns brown or black on standing (met-myohemoglobin), must be demonstrated to be a protein. Furthermore, the presence of other abnormal pigments of nonprotein nature must be ruled out. To 1 ml. of urine add 3 ml. of 3% sulfosalicylic acid.[5] Mix and filter or centrifuge. If the pigment is precipitated, it is a protein. If the filtrate or centrifugate is the normal color of urine, no abnormal nonprotein pigment is present. (The classical heat-and-acetic-acid test does not precipitate either myohemoglobin or hemoglobin.)

Second, to 5 ml. of urine add 2.8 Gm. of ammonium sulfate and dissolve by mixing. This brings the urine to 80% saturation. The urine is then filtered or centrifuged. If the filtrate or centrifugate displays the abnormal color, myohemoglobin (met-myohemoglobin) is present. If only the normal color of urine is visible, the precipitated pigment is hemoglobin. This test is applicable both to freshly voided urine and to properly preserved urine. For preservation, the urine should be adjusted to pH 7.0 to 7.5 with dilute sodium hydroxide and then refrigerated. Urine preserved in this manner for as long as two months was still capable of giving a positive test for myohemoglobin, despite a moderate degree of bacterial contamination.

Comment

This test has been successfully applied in two cases of idiopathic paroxysmal myohemoglobinuria. In one case the urine was acid and in the other it was alkaline. The presence of myohemoglobin was confirmed by spectrophotometry and paper electrophoresis in both cases. In five cases of hemoglobinuria the test correctly indicated the presence of hemoglobin. The difference is solubility on which the test is based has been applied for many years to the removal of hemoglobin during the preparation of myohemoglobin from muscle.[6] At 80% saturation with ammonium sulfate, hemo-



Filtrates of normal urine to which human hemoglobin was added (upper row of tubes) and of urine from a patient with myohemoglobinuria (lower row). Increasing amounts of ammonium sulfate added before filtration to give percentage of saturation indicated above tubes. Faint traces of hemoglobin still present at 75% saturation, not apparent in photograph.

From the Metabolic Unit, Rothschild-Hadassah-University Hospital, and the departments of experimental pathology and biochemistry of the Hebrew University-Hadassah Medical School.

globin is completely precipitated from solution, along with denatured myohemoglobin, but only minor amounts of undenatured myohemoglobin are precipitated (see figure). At 100% saturation, myohemoglobin is completely precipitated, together with significant amounts of normal urinary pigments.

Only when the abnormal pigment has been shown by the sulfosalicylic acid test to be protein is this test applicable. Demonstration that the pigment is a protein rules out porphyrinuria, alkaptonuria, and drugs or dyes as causes of abnormally pigmented urine. The test described here is not only of use in confirming the diagnosis of myohemoglobinuria but may also help define more sharply the clinical entity march hemoglobinuria[7] or "exercise myohemoglobinuria."[8] Undoubtedly, many cases of exertional myohemoglobinuria have been classified as march hemoglobinuria,[9] apparently for want of a simple, readily available diagnostic test. All the clinical and laboratory criteria that may be used in differentiating between myohemoglobinuria and hemoglobinuria are listed in the table.

Differentiation Between Idiopathic Myohemoglobinuria and Hemoglobinuria[*]

	Myohemoglobinuria	Hemoglobinuria
Clinical signs and symptoms	Painful, tender, swollen muscles with limitation of motion	Muscles normal
Appearance of serum.	Not hemolytic	Hemolytic
Serum bilirubin.......	Normal	Rises
Reticulocyte count....	Normal	Rises
Spectral characteristics of urinary pigment:		
Nonoxygenated	Rapidly changes to met-form giving spectrum almost identical with that of met-hemoglobin	Does not usually change to met-form spontaneously
Oxygenated form...	Maximum absorption peak at 582[†]	Maximum absorption peak at 577[†]
Carbon monoxide complex	Maximum absorption peak at 579	Maximum absorption peak at 570
Electrophoresis	Myohemoglobin (met-myohemoglobin) migrates at about half the speed of hemoglobin in barbital buffer pH 8.6	
Solubility in urine 80% saturated with ammonium sulfate	Myohemoglobin largely remains in solution	Hemoglobin completely precipitated

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[*] Large differences in molecular weights and oxygen dissociation curves of myohemoglobin and hemoglobin might also be of value in their differentiation.

[†] Fluorescent lamp as source of light aids in differentiation based on this spectral difference.[3]

Summary

A simple test can differentiate myohemoglobinuria from hemoglobinuria by means of 80% saturation of the urine with ammonium sulfate.

This study was aided by the Anna R. Wasserman Lowenberg Research Fund.

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INCREASED LINOLEATE CONTENT OF FOODS.—We know that the essential polyunsaturated fatty acid—linoleic acid—is assumed by many to play a major role in the diets known to lower the serum cholesterol. . . . A number of common foodstuffs can be modified so as to increase their content of linoleic acid appreciably without changing taste or appearance. Vegetable oil can be homogenized with skim milk to produce a palatable whole milk. Ice cream and certain cheeses can be made with vegetable oils rather than butterfat, and a spread resembling butter can be manufactured that is rich in linoleic acid. Chickens, if fed a diet rich in essential fatty acids, will produce eggs whose yolks contain a high proportion of polyunsaturated fatty acids. All these things are within our technical grasp—the point is, we still do not have a pattern of fatty acids that we can refer to as being optimal for human health.—T. B. Van Itallie, M.D., Nutritional Research in Atherosclerosis—A Progress Report, *Journal of the American Dietetic Association,* March, 1958.

INTESTINAL OBSTRUCTION DUE TO BISHYDROXYCOUMARIN POISONING

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The excellent results achieved by long-term therapy with anticoagulants in cases of coronary thrombosis and recurrent thrombophlebitis have been marred by the occasional severe toxic reaction. Hematuria, gastrointestinal bleeding, and hemoptysis are the most commonly encountered complications. Toxic manifestations of bishydroxycoumarin (Dicumarol) therapy producing acute abdominal mergencies have been infrequently reported. Bernan and Mainella,[1] in 1952, reported five cases of nticoagulant toxicity resulting in abdominal sympoms, in one of which the patient presented signs f intestinal obstruction. At operation a hemorhagic infarct of the jejunum was found and reected. Mendelsohn and Iglauer,[2] in 1953, reported wo cases of bishydroxycoumarin toxicity producng a picture of intestinal obstruction. Both patients lad free blood on the peritoneal cavity; however, o obstruction was found.

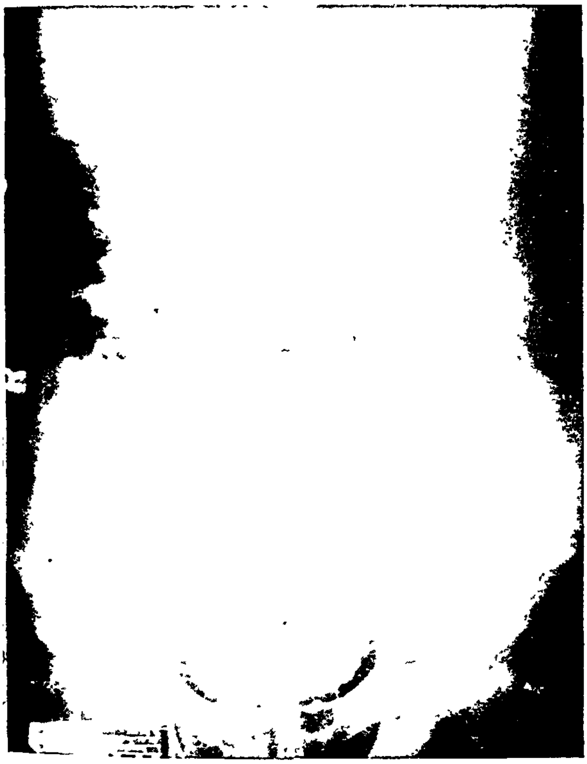

Fig. 1.—Roentgenogram of abdomen, with patient recumbent. Horseshoe loop of distended intestine in upper abdomen annot be differentiated as to small or large intestine.

The following case represents a rare instance of intestinal obstruction caused by overdosage of bishydroxycoumarin.

A 69-year-old man was admitted to Seaside Memorial Hospital for the third time on April 21, 1957, complaining of cramping abdominal pain and vomiting blood for three days. He had been well until Aug. 1, 1956, when he was hospitalized for thrombophlebitis of the left leg with a left pulmonary infarct. Bishydroxycoumarin therapy was started. and the patient was discharged, remaining on this therapy, on Aug. 14, 1956. He was readmitted to the hospital on Feb. 23, 1957, with pain and claudication of one month's duration in the right calf. Bilateral femoral arteriography showed obstruction of both superficial femoral arteries with poor peripheral run-off. After this hospitalization he was maintained on bishydroxycoumarin therapy on an outpatient basis. Control remained at a therapeutic level until four weeks before admission, when the patient failed to return for follow-up. For the next four weeks the patient took as much of the drug as he felt he needed, sometimes as much as 200 mg. per day.

Fig. 2—Roentgenogram of abdomen, with patient standing. No fluid levels are seen in the intestine.

Physical examination on admission showed a pulse rate of 76 per minute, respiration rate 20 per minute, temperature 98.6 F (37 C), and blood pressure 110/80 mm. Hg. Eyes, ears, nose, and throat were not remarkable. There were wheezes, without rales, in both lungs. The abdomen was

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From the surgical service of the Seaside Memorial Hospital.

distended and tense with shifting dullness. No peristalsis was heard. The laboratory examination showed a red blood cell count of 4,700,000 per cubic millimeter. The hemoglobin level was 13.6 Gm. per 100 cc. Urinalysis was normal. Prothrombin time was under 10%.

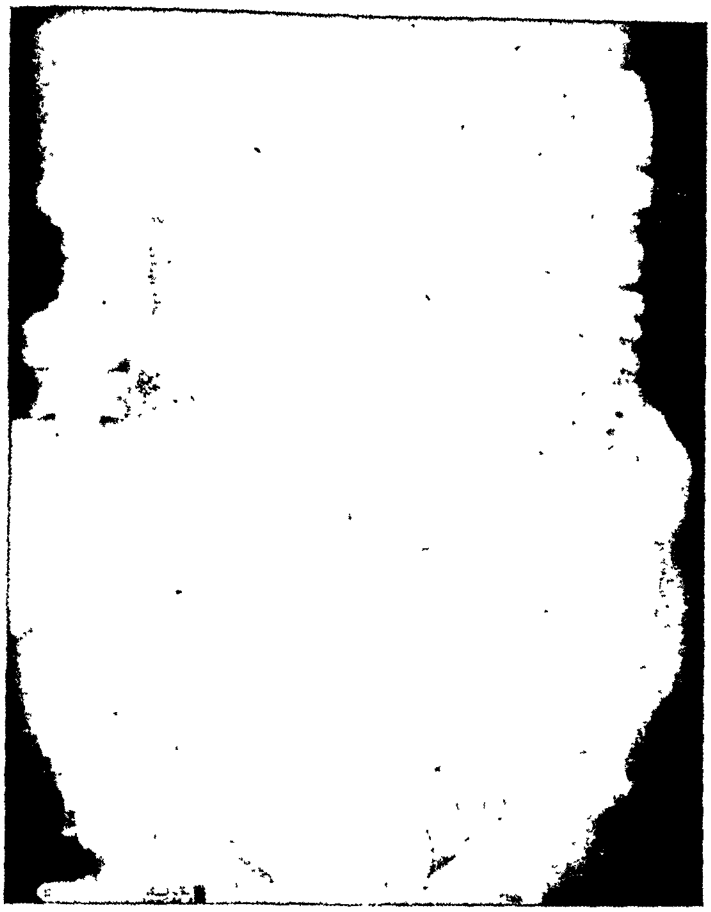

Fig. 3.—Roentgenogram of colon after barium enema. Distention of small intestine is consistent with mechanical obstruction.

During the next 24 hours the patient was given 150 mg. of vitamin K_1 oxide. He vomited blood on three occasions, approximately 300 cc. each time. On the second hospital day, chest and abdominal x-rays revealed pneumonitis at the base of the right lung and obstruction of the small intestine, although the possibility of an obstruction of the large intestine could not be completely excluded (fig. 1 and 2). A tentative diagnosis of intestinal obstruction was made, and surgical consultation was requested. A barium enema outlined a normal colon (fig. 3).

Blood transfusions were started, and the patient was taken to surgery at 8 p. m. At operation a moderate amount of free blood was present in the peritoneal cavity. The upper jejunum was markedly dilated. The obstruction was produced by massive hemorrhage into the wall of the jejunum approximately 6 in. in length. There were also other segments of the small intestine with areas of subserous hemorrhage. The involved segment of jejunum was resected, and intestinal continuity was restored by end-to-end anastomosis. The postoperative course was uneventful and the patient was discharged on the eighth postoperative day.

In a specimen consisting of a 20-cm. segment of small intestine, the entire wall was hemorrhagic and measured 10 mm. in thickness. The mesentery was hemorrhagic. Two centimeters of the proximal and distal end showed normal mucosal pattern. Dense hemorrhagic infiltrations were seen microscopically throughout the entire thickness of the intestinal wall.

Hemorrhagic infarcts of the small intestine producing intestinal obstruction have been reported infrequently. Spencer, Bateman, and Horn[3] collected 33 cases from the literature and added one of their own. Bishydroxycoumarin toxicity producing intestinal obstruction via a hemorrhagic infarct is an even more unusual phenomenon. It is doubtful that conservative therapy would result in resolution of a large infarct and, in the face of a true mechanical obstruction, would be extremely dangerous.

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DIAGNOSIS OF VIRUS INFECTIONS.—Immunologic and serologic studies offer the most practical approach to the diagnosis of virus infections. . . . Immunologic studies of diagnostic significance can be carried out only if blood is obtained in both the acute and convalescent phases of an infection. A single high titer may only reflect previous experience with a suspected virus and bear no relationship to the disease being studied; a minimum of a four-fold increase in antibody concentration is considered diagnostic. The serum should be obtained three to six weeks apart, collected under sterile precautions, and stored at 4° C. until studied. The main disadvantage of this method is that the etiology of an infection is not immediately apparent. . . . Serologic tests of value in the diagnosis of viral infections are complement fixation, agglutination, hemagglutinin-inhibition and neutralization. Complement-fixation has the greatest field of application. Hemagglutinin-inhibition and detection of neutralizing antibody are the next most useful; agglutination is employed least frequently.—Louis Weinstein, M.D., and Te-Wen Chang, M.D., The Diagnosis of Virus Infection, *The Medical Clinics of North America,* September, 1957.

THROMBOCYTOPENIA AND LEUKOPENIA ASSOCIATED WITH USE OF SULFAMETHOXYPYRIDAZINE

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Sulfamethoxypyridazine (Kynex) has recently been introduced as a new antibacterial sulfonamide with good gastrointestinal absorption and prolonged action. It has been proposed for use both as a prophylactic agent and for the therapy of subacute or chronic infections where sulfonamides have previously been employed.[1] To date no reports of major toxic reactions to sulfamethoxypyridazine have been noted in the literature. It is the purpose of this report to present two cases of severe toxicity with predominantly hematological manifestations secondary to sulfamethoxypyridazine.

Report of Cases

Case 1.—A 36-year-old housewife noted headache, heavy yellow postnasal drip, and fever on June 13, 1957. Two days later her private physician started therapy with sulfamethoxypyridazine, 0.5 Gm. twice a day. A total of 15 tablets were taken in seven and one-half days. On the eighth day the patient observed a "rash" and that evening vomited "coffee ground" material. The following day the rash was seen to consist of discrete small red spots which were not pruritic, and she observed blood in the urine. Ten days after the start of sulfamethoxypyridazine therapy the patient noted vaginal bleeding, and the following day she vomited blood and had a series of bowel movements containing fresh blood. History revealed that the patient had taken an unknown sulfonamide some years previously for a respiratory infection without untoward reaction.

Physical examination when the patient entered the hospital on June 25 revealed an afebrile woman with a blood pressure of 96/60 mm. Hg. There was a generalized purpuric rash, most marked on the legs, lower arms, and axillary folds. The Rumpel-Leede test was positive. The gums were pale, and a few purpuric spots were seen on the hard and soft palates. The pharynx was otherwise normal. The nose was moderately congested with a clear mucoid discharge. The liver was palpable 2 cm. below the right costal margin and was elastic but not tender. The spleen was not palpable and there was no lymphadenopathy. A profuse, bloody vaginal discharge was evident, and bloody feces were found in the rectum. Serial blood cell counts are recorded in the table. The day after admission a peripheral blood smear showed moderate hypochromia and basophilic stippling. The reticulocyte count was 6.5% and the prothrombin time was normal.

The markedly reduced number of platelets seen on the peripheral blood smear supported the initial clinical impression of a thrombocytopenic syndrome. This was confirmed by the platelet count of 8,000 per cubic millimeter on the following day. The anemia was felt to result from blood loss. The patient was given ACTH gel, 40 units intramuscularly, daily for three days and prednisone, 10 mg. four times daily, for five doses and then every eight hours through the remaining five days of her hospitalization. In addition she was given 1 Gm. of ascorbic acid, 50 mg. of rutin, and 1.2 Gm. of ferrous sulfate daily until discharge.

The patient remained afebrile, and no new cutaneous bleeding was observed after the first hospital day. The vaginal bleeding ceased by the third day, at which time the Rumpel-Leede test was negative. The platelet count rose rapidly to normal. The liver remained as on admission. After one week of hospitalization the patient was discharged. A maintenance dose of 10 mg. of prednisone was given daily for five days. A complete blood cell count performed on Aug. 5, 1957, revealed a hemoglobin level of 12 Gm. per 100 cc., a red blood cell count of 4,260,000 per cubic millimeter, and a white blood cell count of 7,700 per cubic millimeter, with a normal differential. The platelet count was 220,000 per cubic millimeter.

Case 2.—A 64-year-old male had suffered from chronic benign prostatic hypertrophy and chronic nonspecific prostatitis since April, 1952. He was followed at six-month intervals. On April 6, 1957, he complained of some recurrence of perineal discomfort. The prostatic expression at that time revealed pus clumps. The patient was given 3 Gm. of sulfisoxazole (Gantrisin) per day for two days. When he was seen on June 8, 1957, his symptoms had increased and, in addition to an increase in residual urine, the pus clumps were increased in the prostatic expression. The patient was given sulfamethoxypyridazine, 0.5 Gm. every six hours for four doses, and then was instructed to take 0.5 Gm. daily. Four weeks later pus was still present in the prostatic expression, and the dose of sulfamethoxypyridazine was increased to 0.5 Gm. twice a day. On the 30th day of sulfonamide therapy, a complete blood cell count revealed a hemoglobin level of 12.5 Gm. per 100 cc., a red blood cell count of 4,100,000 per cubic millimeter, and a white blood cell count of 5,150, with a normal differential. On smear the red blood cells and white blood cells appeared normal. On July 20, 42 days after the start of sulfamethoxypyridazine therapy, the patient developed malaise and stopped medication but resumed it again on the following day. The next day, the patient experienced chills, fever, and back pain relieved by aspirin. Two days later the metacarpophalangeal joints of the thumbs became acutely painful, as did the right shoulder. At the same time a rash consisting of "tiny red spots" was observed in each axilla and a "red blush" developed over the upper trunk. The temperature rose to 103 F (39.4 C).

Physical examination on admission revealed an acutely ill, elderly male with a temperature of 104 F (40 C), blood pressure of 166/100 mm. Hg, and a pulse rate of 120. Over the upper trunk there was a diffuse, red, macular rash, and numerous petechiae were observed in each axilla and in the groin. A firm nontender liver was palpated 3 fingerbreadths below the right costal margin. The spleen was felt 1 fingerbreadth below the left costal margin and was soft and nontender. There was acute tenderness over the metacarpophalangeal joints of both thumbs and on motion of the right shoulder. The Rumpel-Leede test was markedly positive.

Urinalysis on admission revealed a specific gravity of 1.015, acid reaction, and no albumin, sugar, or bile; the microscopic examination was negative, including a search for abnormal crystals. Three subsequent urinalyses were normal. The serial blood cell counts are recorded in the table. The bone marrow aspirate two days after admission

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From the Department of Medicine, St. Luke's Hospital.

revealed mild granulopoietic hyperplasia with prominence of immature forms and a decrease in erythropoiesis. Megakaryocytes appeared normal. Marrow examination six days later was normal. Blood chemical findings on admission were as follows: blood urea nitrogen, 11.9 mg. per 100 cc.; albumin, 3.7 mg. per 100 cc.; globulin, 2.5 mg. per 100 cc.; serum glutamic oxalacetic transaminase, 74 units; alkaline phosphatase, 4.6 K[illegible] units; acid phosphatase, 1.1 King-Armstrong [illegible] 0.6 mg. per 100 cc.; sodium, 148 mEq. per liter; potassium, 3.6 mEq. per liter; chlorides, 107 mEq. per liter; and cephalin flocculation, 3+. The sulfobromophthalein (Bromsulfalein) test revealed 15% retention after 45 minutes. One week later the sulfobromophthalein retention was 6%; serum glutamic oxalacetic transaminase, 30 units; alkaline phosphatase, 5.2 King-Armstrong units; cephalin flocculation negative; and thymol turbidity 12.9 units. The serology was negative. Examination of a clotted peripheral blood specimen for L. E. cells was negative. X-rays revealed only osteoarthritic changes.

The markedly reduced number of platelets seen on the peripheral blood smear supported the initial clinical impression of a thrombocytopenic syndrome. This was confirmed by the platelet count of 46,000 per cubic millimeter on the following day. The presence of fever, arthritis, hepatosplenomegaly, and lymphadenopathy suggested serum sickness.

Prednisone, 10 mg. every six hours, was given starting on the day of admission. After four days, dosage was slowly decreased and the drug was withdrawn on the 10th hospital day. A single injection of 40 units of ACTH gel was given on each of the last two days of prednisone therapy. There was a prompt symptomatic response. The patient's temperature was 104 F on the first day and was normal by the third hospital day. No new cutaneous bleeding was observed after the first day. The platelet count reached normal levels on the 10th hospital day and the Rumpel-Leede test became negative 3 days later. Leukopenia was most marked three days after admission. The white blood cell count returned to normal on the sixth hospital day.

At the time of discharge, on the 12th day, the spleen had receded to 1 fingerbreadth below the left costal margin and the liver was only 1½ fingerbreadths below the right costal margin. The lymphadenopathy had regressed to one-half its previous proportions. One week later the spleen was no longer palpable. Follow-up examination has revealed no alteration in these findings.

Comment

Serious reactions after the use of sulfonamides have frequently been reported. The incidence of these toxic side-effects varies with the preparation used. A history of reaction to any sulfonamide makes a reaction to its subsequent use more likely and may sensitize the patient to other drugs of this group.[2] It is of interest that both of the reported patients had previously ingested a sulfonamide compound without untoward reaction.

The mechanism of drug-induced thrombocytopenia is generally thought to be an immunological reaction in which platelet agglutinins can frequently be demonstrated. Recovery is usually spontaneous on withdrawal of the offending medicament.[3] The use of steroids for bleeding secondary to thrombocytopenia appears well established. Their efficacy is believed to reflect an effect primarily upon capillary resistance although on occasion steroid therapy does cause an increase in platelet count or a fall in platelet agglutinins.[4]

Although steroids were not used in the reported cases in a specific effort to influence the white blood cell count, it is worthy of note that these compounds are considered of value in the treatment of toxic granulocytopenia—particularly where leukocyte agglutinins can be demonstrated.[5] Development of serum sickness after use of sulfonamides has been emphasized by Longcope.[6] The time interval between first contact and the development of the clinical state in the second case was 45 days—somewhat longer than usually reported.

Serial Blood Cell Counts in Two Cases of Thrombocytopenia Associated with Use of Sulfamethoxypyridazine

		Leukocytes, %							
Date	Hemoglobin, Gm./100 Cc.	Total/ Cu. Mm.	Polymorphonuclear Cells	Band Cells	Lymphocytes	Monocytes	Eosinophils	Basophils	Platelets/ Cu. Mm.
Case 1									
6/25	8.9	8,700	52	0	42	4	2	0	(Few on smear)
6/26	8.3	10,400	75	0	22	2	0	1	8,000
6/28	8.1	13,100	63	0	29	7	0	1	140,000
6/29	8.3	12,500	61	0	33	5	0	1	251,000
Case 2									
7/24	13.6	3,200	61	4	19	2	0	14	(Few on smear)
7/25	13.2	2,050	60	0	16	20	2	2	46,000
7/26	14.4	1,750	37	2	22	34	0	3	28,000
7/27	14.8	2,600	38	0	26	36	0	0	92,000
7/29	15.2	5,200	65	0	31	4	0	0	115,000
8/1	15.6	8,200	55	0	37	8	0	0	190,000
8/2	11.8	7,450	66	0	28	5	1	0	240,000

Summary

Two cases of thrombocytopenia were associated with the use of sulfamethoxypyridazine. In the second case leukopenia was also noted.

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MYOCARDIAL INFARCTION IN AN INFANT WITH TRANSPOSITION OF THE GREAT VESSELS

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In complete transposition of the great vessels, the aorta arises from the right ventricle and the pulmonary artery from the left ventricle. This congenital anomaly is incompatible with survival unless there is a septal defect which allows mixture of arterial and venous blood.

The case reported here is of particular interest because an electrocardiogram taken a few hours before death showed the pattern of an impending anterior myocardial infarction. This, as far as could be determined, has not been previously reported in a 7-week-old infant with complete transposition of the great vessels.

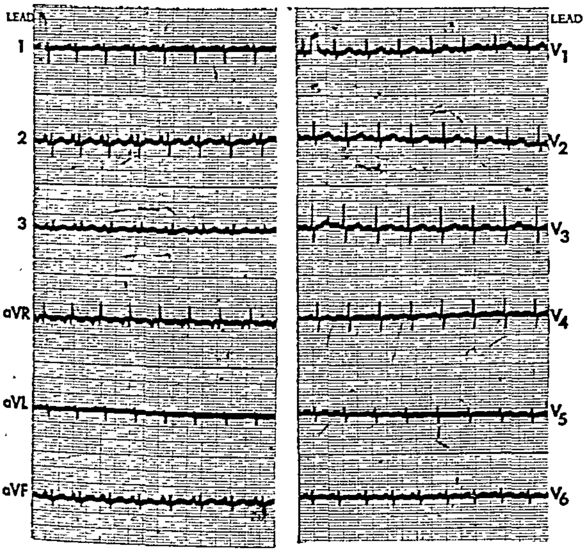

Fig. 1.—Electrocardiogram taken two days after birth. Findings are essentially within normal limits.

Report of a Case

In a male infant who was born at St. Mary's Hospital on March 27, 1957, marked cyanosis appeared soon after birth. X-ray of the chest showed no evidence of pathology. An electrocardiogram taken two days after birth (fig. 1) was not definitely abnormal. A systolic mumur was heard over the precordium. The infant made fairly good progress and was dismissed from the hospital.

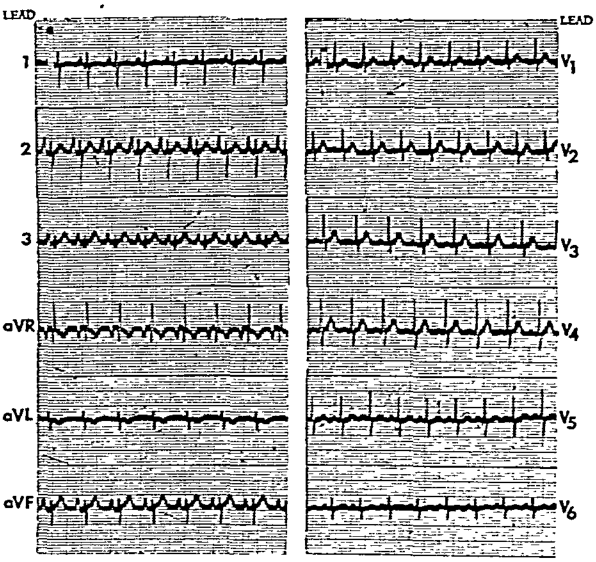

Fig. 2.—Electrocardiogram taken at age of 7 weeks. Tall, prominent P waves best seen in lead 2 indicate auricular hypertrophy. R wave in V_1 and aVR is much more prominent and S wave in lead 1 deeper, as compared to previous tracing (fig. 1). These findings indicate right ventricular hypertrophy.

The patient was readmitted on May 17, 1957, approximately 7 weeks old. There was marked dyspnea, cough, and cyanosis, and a systolic murmur was heard over the precordium. The x-ray findings were as follows: "Cardiac enlargement and liver enlargement with increased vascularity of the lung fields, probably representing some degree of congestive changes." An electrocardiogram (fig. 2) revealed

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From the Department of Electrocardiography, St. Mary's Hospital.

the following information: "The changes which have occurred since the last tracing was taken indicate considerable auricular and right ventricular hypertrophy." The patient was again dismissed from the hospital on May 21, 1957, only to be readmitted the following day. There was deep cyanosis, gasping respiration, and evidence of bronchopneumonia. A chest x-ray taken at that time showed enlarged cardiac silhouette and pulmonary congestion. An electrocardiogram (fig. 3) was obtained a few hours before death. The changes indicated an impending anterior myocardial infarction.

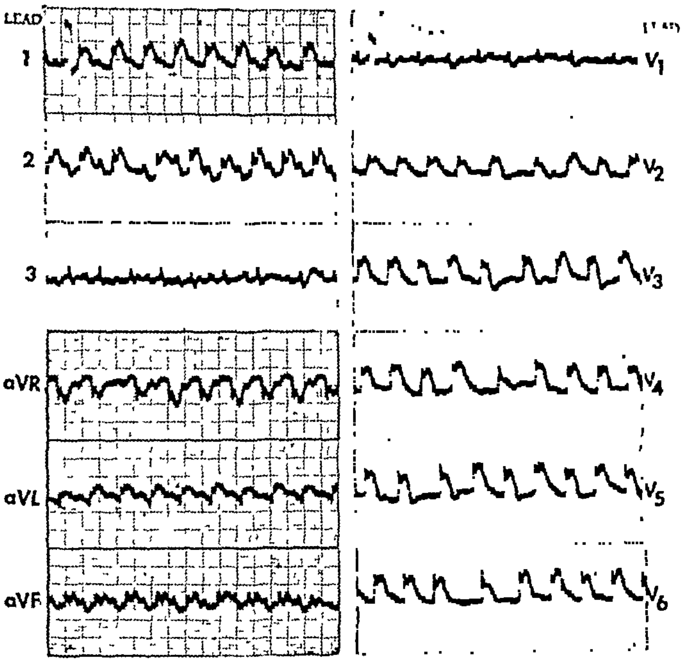

Fig. 3.—Electrocardiogram taken at the age of 7 weeks and a few hours before death. Marked ST segment elevations are apparent in Leads 1, 2, aVL, and most of the precordial leads. Q wave has developed in aVL. These findings indicate impending anterior myocardial infarction.

Autopsy Findings.—The heart was enlarged. The foramen ovale and duct arteriosus were patent. There were no defects of the interatrial and interventricular septums. There was transposition of the great vessels. The aorta arose from the right ventricle. The right ventricular myocardium measured 0.4 cm. in thickness. The valves were smooth and competent.

On microscopic examination a section from the anterior portion of the interventricular septum showed a few small focal areas of necrosis associated with interstitial hemorrhages. The endocardium showed moderate proliferative reaction and the presence of a few prominent nerve trunks. There was no inflammatory cellular exudate. The myocardial necroses were ischemic in origin.

Comment

Transposition of the great vessels is incompatible with survival unless there is a septal defect, most commonly a patent foramen ovale. In complete transposition, as in this case, the circuit from right ventricle to the transposed aorta and systemic circulation is virtually closed, as is the circuit from the left ventricle into the transposed pulmonary artery and lesser circulation. Admixture of blood is possible only through an associated shunt, in this case, a patent foramen ovale. With the failure of the left ventricle this shunt practically ceased. The coronary arteries arising from the transposed aorta received only venous blood, which in turn led to necrosis of the myocardium, presenting in the electrocardiogran a pattern of acute myocardial infarction.

Summary

An unusual case of myocardial infarction occurred in an infant 7 weeks old with transposition of the great vessels. Serial electrocardiograms were taken from the time of birth to the time of death. The congenital cardiac anomaly and the myocardial infarction were verified at autopsy. Complete transposition of the large vessels with the coronary arteries arising from the transposed aorta supplying mostly venous blood to the myocardium was the basic congenital anomaly in this case. Myocardial infarction in infants has been described by others, but always on the basis of congenital anomaly of the coronary vessels. This case, as far as could be determined, is the first in which myocardial infarction resulted as a direct result of transposition of the great vessels with the coronary arteries originating in the transposed aorta. The diagnosis of myocardial infarction was clearly established before death by the electrocardiogram.

ANTIBIOTICS AND TUBAL PREGNANCY.—Krohn, Beacham, Johnson, Greenhill, and others feel that there is an increasing incidence of tubal pregnancy caused by the common usage of antibiotics in treating salpingitis. Tubal patency is being maintained in patients who formerly would have had complete tubal occlusion. The presence of a patent tubal lumen does not mean that normal tubal physiology is maintained. The disturbance of the function of the tubal ciliary cells, decrease in peristaltic activity, and creation of more blind folds undoubtedly delay the migration of the fertilized egg and predispose to tubal nidation. Since these changes are more marked in the distal one third of the tube and since the "chronic" ectopic pregnancy usually occurs in the terminal portion of the tube, it seems reasonable to conclude that antibiotic therapy may predispose to the more chronic or obscure forms of ectopic gestation.—S. L. Parker Jr., M.D., and R. T. Parker, M.D., "Chronic" Ectopic Tubal Pregnancy, *American Journal of Obstetrics and Gynecology,* December, 1957.

COMPLETE INTRATHORACIC GOITER SIMULATING AN ANEURYSM OF THE ASCENDING AORTA

REPORT OF A CASE

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Aberrant thyroid tissue is most commonly found n the thorax.[1] Many case reports have been published about aberrant thyroid tissue, whereas reports of complete intrathoracic goiters without isible cervical connections are rare. Many of the o-called complete intrathoracic goiters will be *ound to have some slight but definite connection* ithin the neck.

DeCourcy and Price[2] reported finding three complete" intrathoracic goiters in a series of 1,000 yroid operations, all of which had some cervical onnection. In 1947 Rives[3] reviewed the English nd European literature for the years 1936-1946. He found only 14 cases of complete intrathoracic oiter. Of these, only two had no cervical connection. Ellis, Good, and Seybold[4] in 1957 reviewed eports of intrathoracic goiters removed at the Mayo linic and found 24 cases on file in which the umor was removed by routes other than cervical. Only five of these were felt to have had no connection in the neck.

The problem of differentiation between various omplete intrathoracic goiters and other thoracic esions occasionally becomes extremely difficult because of conflicting results in diagnostic studies. The following case is presented to illustrate this ifficulty.

A 39-year-old woman was admitted to the University Hospital on March 9, 1954, complaining of pain in her back hich radiated to the right side of her chest. The history evealed that the patient had had an abdominal-perineal section 10 years previously for rectal stricture secondary o lymphogranuloma venereum. Roentgenographic examination and fluoroscopy prior to hospitalization gave an impression of a small, saccular aneurysm of the ascending orta. Physical examination revealed a well-nourished, well-eveloped, Negro female in no acute distress. The essential hysical findings were as follows: The neck was supple with o adenopathy, and the thyroid was not enlarged. The rachea was questionably shifted to the left. There was no racheal tug. There was some hoarseness to her voice; however, the vocal cords were normal. The chest, lungs, and eart were not unusual; no bruit or murmurs were heard. The abdomen was negative except for a colostomy in the eft lower quadrant and a well-healed left paramedian incisional scar. Roentgenographic examination of the chest evealed a shadow which was thought to be a saccular neurysm of the thoracic aorta at the junction of the ascending aorta and innominate artery, measuring 4 by 5 cm. fig. 1 and 2). A retrograde aortogram was interpreted as aneurysm of the ascending arch of the aorta beginning at the region of the innominate artery." On reexamination of the chest, including fluoroscopy and barium meal, there was again demonstrated the above density in the right mediastinum in the area of the ascending arch of the aorta. The Valsalva test was performed and, although the mass did not rise, it appeared wider and to pulsate, although the examiner could not tell whether the pulsations were expansile in type. *A radioactive iodine survey suggested a substernal* or mediastinal thyroid mass. A larger dose of radioactive iodine was given a few days later, and it was felt that the mass was thyroid tissue. The neck was explored through a collar incision. The lobes in the thyroid gland were identified. The gland appeared to be entirely normal; there was no evidence of substernal extension; and no definitive procedure was performed. Eight days later, a right thoracotomy was performed and a nodule measuring 4.5 by 3.5 by 3 cm. was found fixed to the anterior ascending aorta near the arch. There could not be demonstrated any type of connection, either fibrous or vascular, between this tumor and the neck. The tumor was dissected free from the aorta and excised without difficulty. The tumor bed was very vascular, but no large blood vessels were noted. The many small vessels supplying the tumor apparently arose directly from the aorta. Microscopic examination of the operative specimen revealed adenomatous thyroid tissue (fig. 3). The patient made an uneventful recovery and was discharged from the hospital on the ninth postoperative day. Two years later, radioactive iodine studies were reported as showing normally functioning cervical thyroid tissue without evidence of substernal extension. The patient stated that she had been asymptomatic since operation.

Fig. 1.—Posteroanterior chest x-ray demonstrating lesion at level of ascending aorta.

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Comment

In an effort to study and consider this type of intrathoracic goiter comprehensively, a differentiation should be made between the three main categories of thyroid tissue: (1) true accessory thyroid glands derived directly from the main thyroid anlage during embryonic life; (2) metastatic thyroid tissue representing cellular masses that are disseminated to different parts of the body from an abnormally proliferating thyroid gland; (3) teratomoid thyroid tissue, perhaps springing from blastomeric material that was deranged or misplaced during the early states of embryonic life.[5]

Since the most common form of anomalous thyroid tissue is that located in the thorax, many classifications have been proposed. Rives[5] believes that there are two general groups: (1) aberrant mediastinal goiters and (2) substernal goiters. This author feels that aberrant mediastinal goiters include all those which have no connection with the thyroid gland proper. He believes that this type arises from aberrant thyroid tissue located within the thorax. Falor and co-workers[6] agree with this concept of origin but classify intrathoracic goiter on the basis of vascular supply: (1) primary intrathoracic goiter (intrathoracic origin of vascular pedicles); (2) secondary intrathoracic goiter (cervical origin of vascular pedicles).

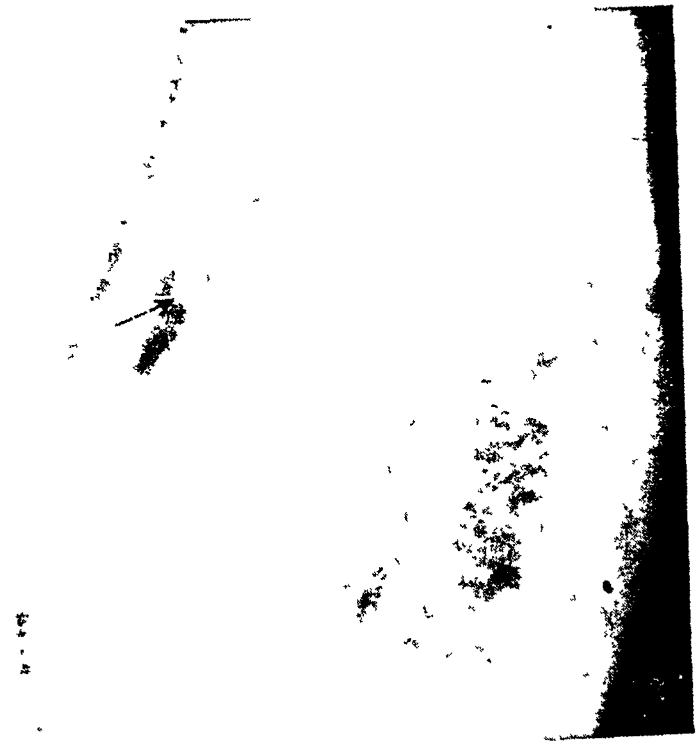

Fig. 2.—Right lateral chest x-ray demonstrating lesion at level of ascending aorta.

Johnston and Twente[7] hypothesized that all intrathoracic goiters arise from the cervical thyroid and receive their blood supply from the superior thyroid or from the inferior thyroid arteries. In support of this theory, many of the so-called complete intrathoracic goiters will be found to have some slight but definite connection with the neck. Rarely, however, an intrathoracic goiter is found which has no demonstrable connection with the neck, either by glandular tissue through its vascular supply or by a fascial band. It is this tumor for which the term "complete intrathoracic goiter" should be reserved

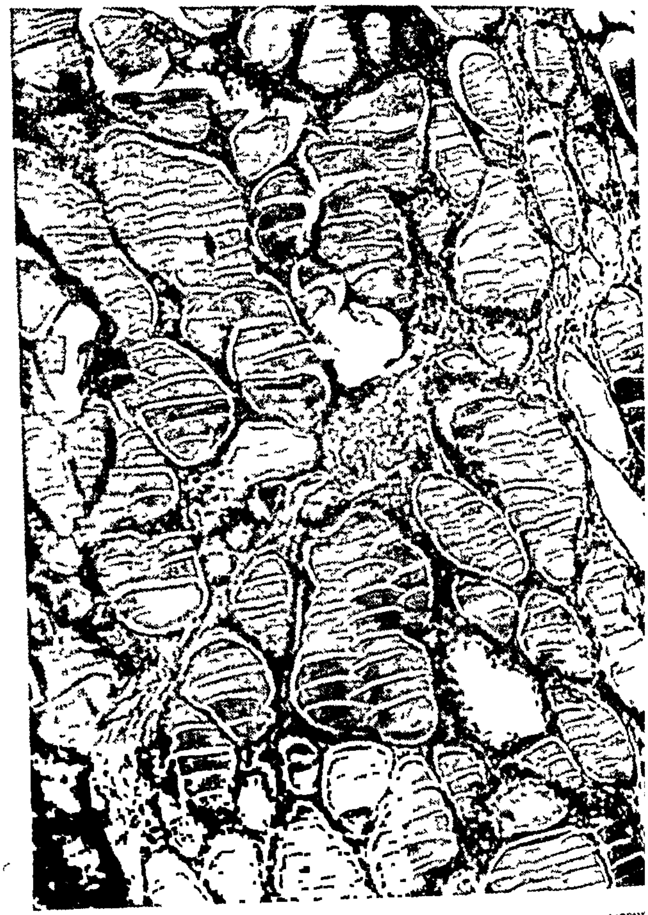

Fig. 3.—Photomicrograph showing numerous circu scribed areas composed of small and large acini distend with colloid.

Summary

A case of complete intrathoracic goiter witho visible connection with the neck has been pr sented. Although similar cases have been reporte the condition is a rarity. In the reports reviewe only seven cases were found in which no connecti with the neck was described. The present case of especial interest because of the difficulty in d ferential diagnosis despite radioactive iodine stu ies and angiocardiography. In retrospect, the ang cardiographic result can be explained on the ba of the vascularity of the tumor, which took up c trast material in high concentration directly fr the aorta and resulted in the impression of "a sm saccular aneurysm." Despite these studies, op ation was necessary to make the diagnosis and move the tumor.

Radioactive iodine studies were done by Dr. J. B W man, division of radioactive isotopes.

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DISSEMINATED COCCIDIOIDOMYCOSIS APPARENTLY CURED WITH AMPHOTERICIN B

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The treatment of disseminated coccidioidomycosis has previously been unsatisfactory. Although a variety of therapeutic agents have been recommended from time to time, none have had any permanent beneficial effect as the disease has pursued its relentless course. Antifungal antibiotics have been employed in recent years.[1] Nystatin has been reported to be of some benefit and has resulted in apparent cure or arrest in a few cases of the disseminated disease.[2] Recently two new antifungal antibiotics, the amphotericins A and B, have been described. They were first isolated from soil samples from the Orinoco River region of Venezuela by the action of a streptomycete.[3] Both forms have antifungal activity when administered parenterally or orally.[4] The B form appears to be more active than the A form against Coccidioides immitis and some of the other yeast-like fungi. Recent studies seem to indicate that a combination of A and B forms increases the absorption and effect of the amphotericin B.[5]

The purpose of this report is to present our experience with the use of amphotericin B in a patient with disseminated musculoskeletal coccidioidomycosis of 10 years' duration.

Report of a Case

The illness of this 34-year-old woman presumably began in January, 1946, while she was visiting in Phoenix, Ariz She was exposed to dust while sightseeing in the nearby desert and a week or two later developed a vague respiratory infection resembling influenza. She recalls having had some chest pain, but no x-rays were made and the illness subsided spontaneously in about a week. In June, 1946, pain in the left lumbar area developed, and in August she was operated upon for what was considered to be an acute osteomyelitis, and a section of the pelvic bone was removed. Cultures were negative, and the pathological report was "granulation tissue, but no organisms seen." A small shadow in the left apex of the lung was observed about this time. The patient remained febrile, the incision failed to heal completely, and three draining sinuses persisted, in spite of extensive therapy with penicillin and sulfonamides for several months. In April, 1947, a mass formed below the incision, and in May a second operation was performed and the entire incision left open on the presumptive diagnosis of tuberculosis. Again cultures were negative. During the next year she was treated with streptomycin and penicillin but remained febrile, with temperatures of 101 to 103 F (38 to 39 C). The incision again healed only partially, leaving several draining sinuses, and new abscesses formed in the left inguinal region and around the incision. Repeated examinations for tuberculosis failed to show organisms.

In May, 1948, the patient was taken to a clinic in Cleveland, where studies for fungi were made. A diagnosis of blastomycosis was made after a positive skin test and positive complement-fixation antibodies for Blastomyces were obtained. It is not known whether she was studied for coccidioidomycosis at this time. During the next year she improved somewhat on therapy with iodides and a vaccine of blastomycin. She became ambulatory, gained weight, and her fever became low-grade, with temperatures from 99 to 101 F (37 to 38 C). Other abscesses, however, continued to form, although the infection was less acute over the next few years.

In March, 1950, the patient entered Duke Hospital for studies by the department of mycology. At this time she had a low-grade fever, and examination was normal except for the local lesions over the left hip and thigh (fig. 1). The lesion in the left lung had disappeared except for a small scar. A pure culture of C. immitis was isolated from pus aspirated from a fluctuant, nondraining area. Complement-fixation tests were slightly positive for Blastomyces and strongly positive for C. immitis. It was the opinion at this time that the patient had had coccidioidomycosis from the

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From the Department of Medicine, University of Alabama Medical Center (Dr. Klapper), and the Department of Bacteriology, School of Medicine, Duke University (Drs. Smith and Conant).

state and that the positive blastomycotic studies represented a cross-reaction. Repeated examinations of the pus for tubercle bacilli were again negative.

Over the next five years, the disease was slowly progressive (fig. 2), and it was during this time that the patient moved to Birmingham, Ala. (1953) and came under the care of one of us (M. S. K.). In this five-year period, she received various types of therapy as they were recommended for the disease. Therapy with prodigiosin had no effect and caused severe febrile reactions and thrombophlebitis at the sites of injection. In October, 1953, and January, 1955, she received one-month courses of 2-hydroxystilbamidine with no effect upon the lesions but some slight improvement in general strength. A mild trigeminal neuropathy developed after the first course, and localized thromboses occurred at the injection sites. C. immitis organisms continued to be demonstrable in the pus. The complement-fixation test remained positive at dilutions of 1:64, and the precipitin test at 1:10 for C. immitis.

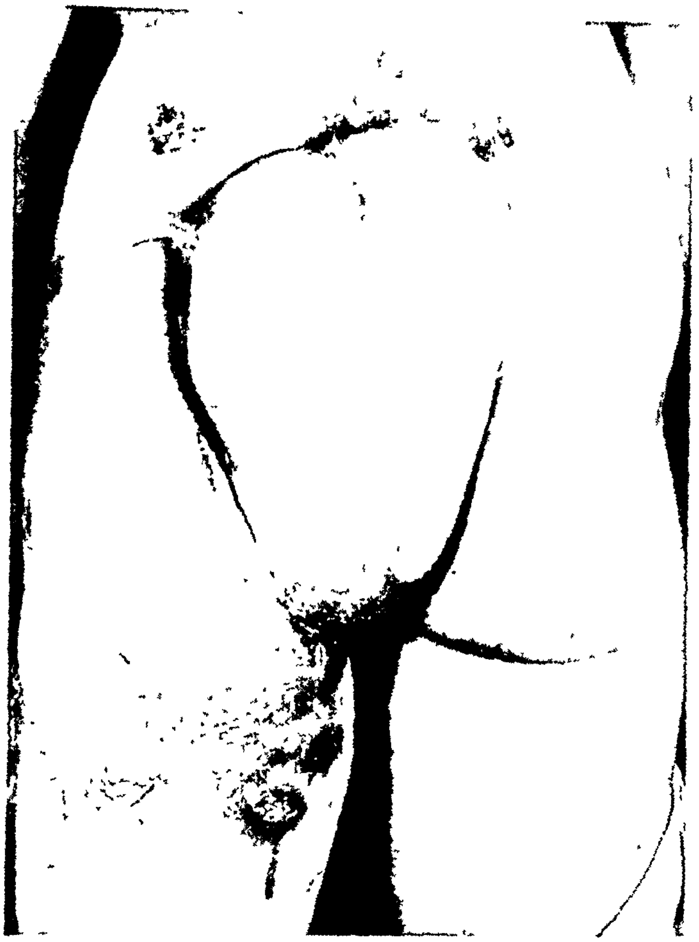

Fig. 1.—Partially healed operative site and abscesses in adjacent areas and over sacrum and posterior region of left thigh (1950).

During the summer of 1955 the disease became more active, fever was higher, and the patient lost weight and strength and tended to be more anemic. A large abscess formed on the right thigh, the first evidence of extension of the disease to this extremity. During the next six months the patient deteriorated physically as her disease ran a more acute course than it had for the previous five years. Four to five new abscesses formed over the right thigh and buttock, her temperature reached 102-103 F almost daily. Coccidioidin vaccine was given without effect. By January, 1956, the patient's weight was 86 lb. (39 kg.), she was able to get around only with the help of crutches or a wheel chair, and she was in constant pain. Frequent transfusions were necessary.

From January, 1956, until June, the patient was given nystatin in doses of 10 Gm. per day. On this therapy she gained 10 lb., the temperature approached its previous low-grade level, 99-101 F, and she again became ambulatory. The new lesions gradually became less painful, but there was no evidence of healing, and new abscesses continued to form. At this time the possibility of using amphotericin B was presented.

Treatment and Course with Amphotericin B.—Therapy with amphotericin B was begun in June, 1956. One gram was given orally four times daily. At this time there were 30 draining sinuses over the left buttock and thigh besides those in the incompletely healed operative site. There were eight draining sinuses over the right buttock and thigh, and one newly formed fluctuant area not yet draining. Within two weeks after institution of amphotericin B therapy, there was definite improvement in appetite and strength The lesions were draining less profusely and the patient wa afebrile. In five weeks it was apparent that the effects of th drug were dramatic. The drainage from the abscesses ha changed from thick purulent material to a scant yello watery discharge. Some of the oldest lesions were healed the patient felt fine and was continuing to gain weight an strength. In seven weeks her weight was 114 lb. (51.7 kg.) the incision had healed over for the first time in 10 years and all the lesions on the left side were healed over. Th lesions on the right side were more persistent but wer tending to heal.

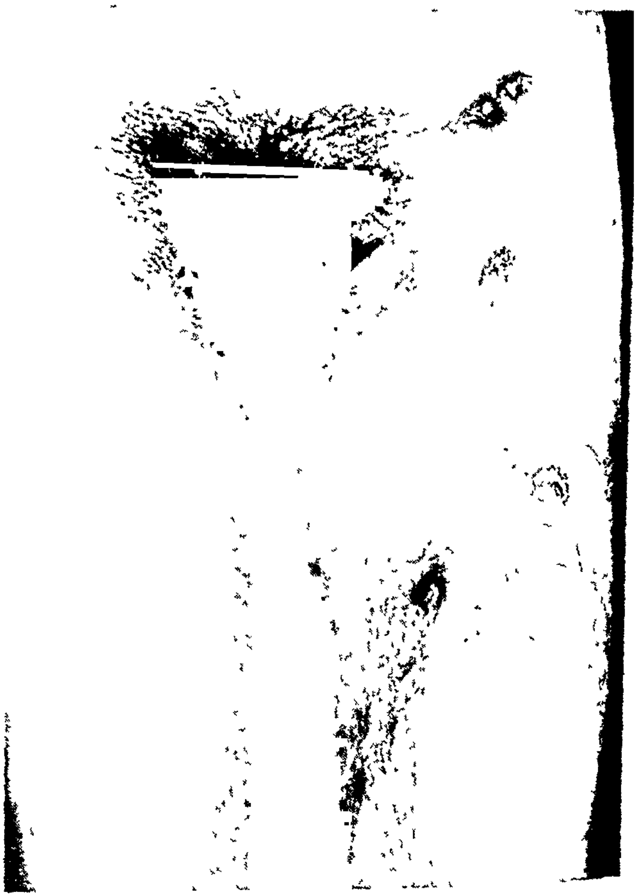

Fig. 2.—Extension of disease process to left inguinal region and anterior thigh (1953).

By October, 1956, three months after beginning therapy with amphotericin B, all lesions were healed and the fluctuant area had resolved. Her weight was 120 lb. (54 4 kg.), and menses, which had ceased spontaneously two years previously, resumed. During this first three-month period of therapy, the white blood cell count gradually returned to normal, and the red blood cell count rose to normal levels (fig. 3). Liver function tests and urinalyses remained normal.

It was decided at this time, although healing appeared complete, to continue therapy for at least one year. The patient was followed periodically for the next year, and therapy was continued with amphotericin B, 1 Gm orally four times daily, until April, 1957, at which time the drug as supplied contained amphotericin A and B with the recommendation that the dose be 2 Gm daily. Treatment was continued through August, 1957, for a total of 14 months. As of October, 1957, the patient appeared to be in good health and the lesions remained healed (fig 4 and 5). It is the opinion of the radiologist that the bone lesions represent an old inactive osteomyelitis involving the left ilium, sacrum, left ischium, and left femur. A slight limp and lumbar deformity are all that persist. Kidney and liver function tests are normal The blood picture is normal. The complement-fixation for coccidioidomycosis in February, 1958, was positive at 1 16 dilution

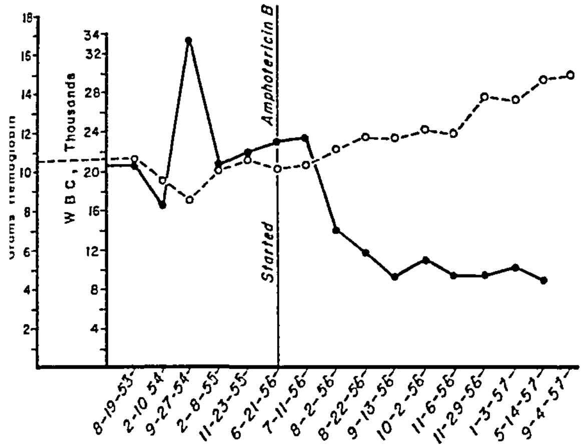

Fig 3—Response of white blood cell count and hemoglobin during therapy with amphotericin B.

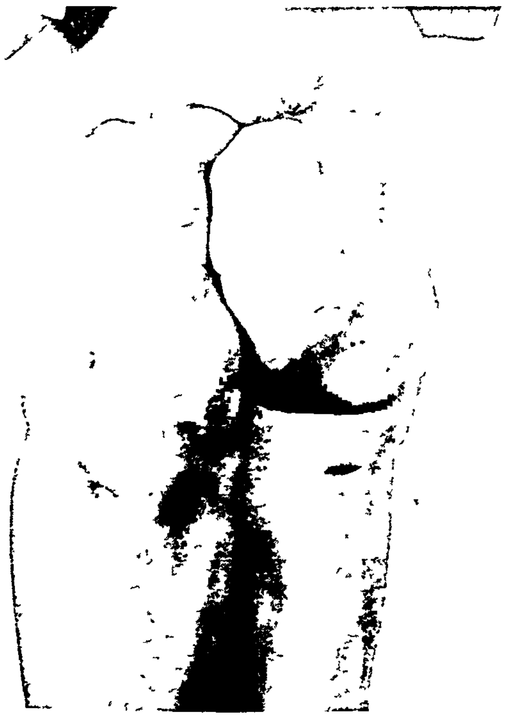

Fig. 4—Left oblique view of healed operative site and well-healed areas of previous abscesses of left buttock and thigh (1957).

Comment

The correct diagnosis in this case was made serologically and by positive cultures of C. immitis. However, it was not made until four years after the onset of the disease and not until the patient had failed to respond to the therapies of the more common bacterial osteomyelitides. The significance of the mild respiratory illness during a short visit to an area endemic for coccidioidomycosis was not appreciated for many months after the onset of the disease. This important detail was recalled by the patient only upon close questioning when a diagnosis of fungus infection was entertained The disease followed a gradually progressive course for 10 years, involving the bones and muscles, responding little or not at all to the various therapies tried. The response to amphotericin B was so definite and occurred so quickly after the institution of therapy that it seems a reasonable assumption that the healing was directly related to the therapy.

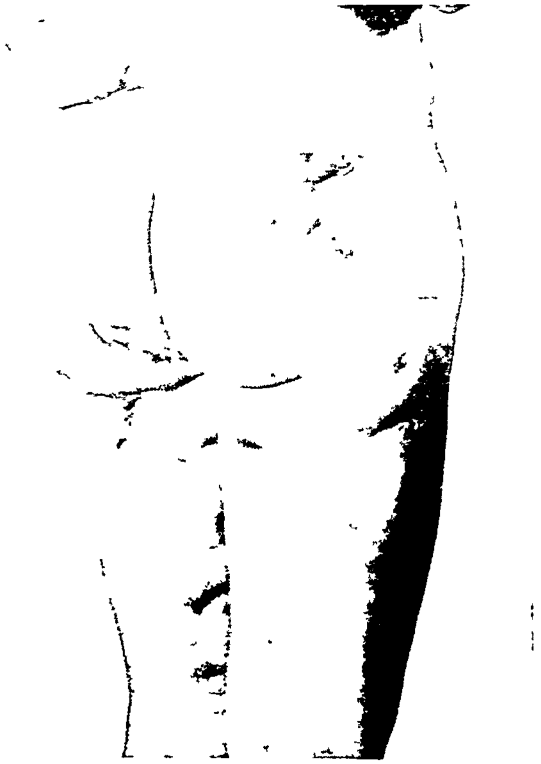

Fig 5—Right oblique view of healed areas of right buttock and thigh and medial surface of left buttock and thigh (1957).

Although healing appeared to be complete in three months, long-term therapy was decided upon because of the tendency of recurrence in osteomyelitic processes and the extensive musculoskeletal involvement present. The drug was administered orally over the entire 14-month period and was well tolerated, with no subjective side-effects. There was no evidence of untoward hepatic, renal, or hematopoietic reactions.

Summary

Apparent cure was effected, after treatment with amphotericin B, of a patient with widespread musculoskeletal coccidioidomycosis of 10 years' duration. The drug was well tolerated with no untoward effects over a 14-month period. The lesions healed within three months and were well healed one year later.

The amphotericin B and nystatin used in this study were supplied by the Squibb Institute for Medical Research, New Brunswick, N. J.

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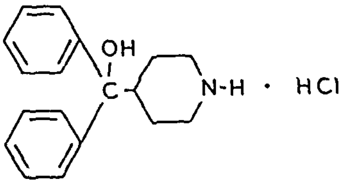
COUNCIL ON DRUGS

NEW AND NONOFFICIAL DRUGS

Monographs and supplemental statements on drugs described here and in subsequent editions of New and Nonofficial Drugs are based on the evaluation of available scientific data and reports of investigations.

H. D. Kautz, M.D., *Secretary.*

Azacyclonol Hydrochloride.—α,α-Diphenyl-4-piperidinemethanol hydrochloride.—α-(4-Piperidyl)benzhydrol hydrochloride.—The structural formula of azacyclonol hydrochloride may be represented as follows:



Actions and Uses.—Azacyclonol hydrochloride, a diphenylmethane, is a structural isomer of pipradrol hydrochloride, differing only with respect to the point of attachment of the piperidine ring to the methanol carbon atom. This subtle change in chemical configuration is responsible for modifying its pharmacological action; pipradrol produces overt supramedullary stimulation, whereas azacyclonol appears to reduce certain types of cerebral stimuli. The drug cannot qualify as a typical central nervous system depressant in man, however, since it does not produce any appreciable sedative or hypnotic effects even in large doses. Meager evidence for a mild depressant effect in animals is noted by the ability of azacyclonol partially to antagonize the stimulant effects of its isomer pipradrol and t prolong the sleeping time, produced by use of hexo barbital, in mice. Neither action has been confirme in man.

The principal experimental basis in man for th present claims that azacyclonol hydrochloride is a antihallucinatory agent stems from experiments reported to demonstrate an antagonistic effect agains the confusion and auditory and visual hallucination induced in human volunteers by mescaline an lysergic acid diethylamide (LSD 25). Subsequen studies attempting to confirm these observation have been unsuccessful.

The clinical trials stemming from these experiments were initiated because of a postulated relationship between drug-induced hallucinations an those associated with natural disorders, a hypothesi which *remains to be proved.* Results of clinica trials with azacyclonol in patients with hallucinations and confusion have been highly variable. Some investigators report decidedly beneficial results in some, but not all, patients; other workers find the drug entirely without value. On the basis of the more favorable reports, it would appear that azacyclonol is most likely to be useful in acute schizophrenia and toxic states; it has been of less value in chronic schizophrenia and has no place in the treatment of psychotic depressive states, obsessive-compulsive disorders, or anxiety reactions. In general, most of the earlier favorable reports are based on studies over relatively brief periods of observation and are largely uncontrolled. More recent observations in chronic schizophrenia suggest that with longer duration of therapy (four to six weeks), in which oral doses of 100 mg. per day are used, a larger number of favorable responses may be obtained than with placebo controls in reducing the incidence of hallucinations, delusions, assaultiveness, agitation, and seclusiveness.

On the basis of both laboratory studies and clinical experience, the toxicity of azacyclonol hydrochloride seems to be negligible. Even in very large doses, both intravenous and oral, the drug has not produced any serious untoward reactions or side-effects. Rarely, a maculopapular skin rash has been observed which is reversible upon discontinuation of therapy.

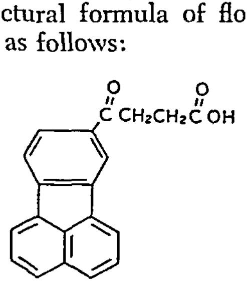
Dosage.—Azacyclonol hydrochloride is administered orally or intravenously. There is no unanimity regarding the effective dosage. Hence, proposed oral dosage for the treatment of acute schizophrenic hallucinosis varies from as little as 20 mg. to as much as 100 mg. three times daily. For schizophrenic patients in whom oral medication is not feasible, 100 mg. of the drug is suggested by direct intravenous injection or slow intravenous drip. For the treatment of toxic psychoses, such as postoperative confusion or delirium tremens, the proposed intravenous dose is 100 mg. every eight hours for one to seven days. Until more evidence can be accumulated to support the therapeutic value of the drug, the foregoing proposed dosages should be considered experimental.

Preparations: tablets 20 mg. and 100 mg.; solution (injection) 20 mg. in 1 cc.

Applicable commercial name: Frenquel.

The Wm. S. Merrell Company cooperated by furnishing scientific data to aid in the evaluation of azacyclonol hydrochloride.

Florantyrone.—γ-Oxo-γ-(8-fluoranthene) butyric acid.—The structural formula of florantyrone may be represented as follows:



Actions and Uses.—Florantyrone is a synthetic substance which, although chemically unrelated to the natural bile salts, produces the pharmacological effects of dehydrocholic acid and related compounds. The drug causes an increase in the volume of bile without stimulating evacuation of the gallbladder or increasing the quantity of total bile solids. Hence, florantyrone is properly classified as a hydrocholeretic agent. The bile produced by administration of this agent is usually deep green in color, low in sediment, and of low viscosity.

Florantyrone has been proposed for use in the medical management of chronic cholecystitis and cholangitis and in the prevention of cholelithiasis. From a theoretical point of view, the production of a copious flow of thin bile may be of value to encourage drainage of the bile ducts by removal of mucus and inspissated bile and debris and to discourage the ascent of infection. However, available clinical studies do not demonstrate the effectiveness of florantyrone in cases in which the gallbladder does not fill and in the presence of stasis of the biliary ducts.

Florantyrone and other hydrocholeretics also have been employed for the treatment of so-called biliary dyskinesia. This condition is supposedly characterized, in part, by hypertonicity of the biliary musculature, resulting in spastic obstruction to the flow of bile. Since it is questionable whether such a clinical entity does, in fact, exist, it is difficult to interpret the significance of case reports of patients with biliary dyskinesia who are alleged to have responded favorably to florantyrone. In the absence of controlled observations, the benefits claimed in biliary dyskinesia may well have been psychological. Nevertheless, some clinicians advocate a trial of the drug in conjunction with antispasmodic agents in cases in which spasm of the sphincter of Oddi is suspected.

Florantyrone is reported to be useful for the treatment of postcholecystectomy syndrome. Although this is a difficult diagnosis to make or refute, the majority of patients treated for this condition showed some degree of symptomatic improvement. Since slow improvement is to be expected after such an operation without treatment by florantyrone, there is no convincing evidence that the improvement cited was due to the drug. However, there may be some validity to the concept that postoperative therapy to increase the flow of bile may compensate to some extent for the missing bile reservoir removed at surgery. There is no doubt that a copious flow of thin bile is helpful in removing small stones or other foreign material overlooked at operation. In patients with T-tube drainage after choledochoplasty, the drug is of considerable value in maintaining the patency of the tube, by preventing or diminishing the amount of incrustation and inspissated material which may form.

There is no valid evidence that florantyrone is useful in the treatment of hepatic dysfunction. The wisdom of employing this or any other hydrocholeretic in the presence of severe hepatitis is questionable. The toxicity of florantyrone is low and its margin of safety wide. As with other hydrocholeretics, the drug may produce some diarrhea. It may also aggravate pruritus in patients with some forms of partial intrahepatic or extrahepatic biliary obstruction.

There is no report of liver toxicity in patients with normal hepatic function. Since the drug is likely to be used in patients with chronic hepatic or biliary tract disease and for long periods of time, further investigation for possible harmful effects in such patients and under such conditions is indicated. Because it increases the flow of bile, florantyrone is contraindicated in patients with complete mechanical biliary obstruction. It should not be used in the presence of acute cholecystitis.

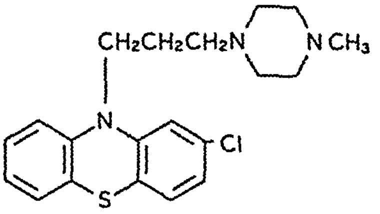
Dosage.—Florantyrone is administered orally. The usual dose for adults ranges from 750 mg. to 1 Gm. daily.

Preparations: tablets 250 mg.

Applicable commercial name: Zanchol.

G. D. Searle & Co. cooperated by furnishing scientific data to aid in the evaluation of florantyrone.

Prochlorperazine.—2-Chloro-10-[3-(1-methyl-4-piperazinyl)propyl]phenothiazine.—The structural formula of prochlorperazine may be represented as follows:



Actions and Uses.—Prochlorperazine has the same actions and uses as prochlorperazine maleate except that it is administered rectally. (See the monograph on prochlorperazine maleate.)

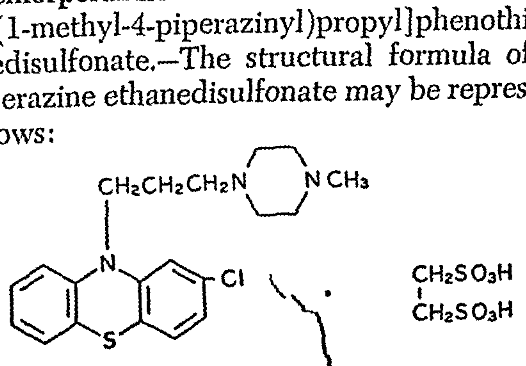
Dosage.—For rectal administration, the suggested dose for adults is one 25-mg. suppository twice daily. Rectal dosages for children are as follows: up to 2 years of age, one-half to one 5-mg. suppository twice daily; ages 2 to 6, one 5-mg. suppository twice daily; ages 6 to 12, one to two 5-mg. suppositories twice daily.

Preparations: suppositories 5 mg. and 25 mg.

Applicable commercial name: Compazine.

Smith, Kline & French Laboratories cooperated by furnishing scientific data to aid in the evaluation of prochlorperazine.

Prochlorperazine Ethanedisulfonate.—2-Chloro-10-[3-(1-methyl-4-piperazinyl)propyl]phenothiazine ethanedisulfonate.—The structural formula of prochlorperazine ethanedisulfonate may be represented as follows:



Actions and Uses.—Prochlorperazine ethanedisulfonate has the same actions and uses as prochlorperazine maleate except that it may be administered intramuscularly as well as orally. Parenteral therapy is usually reserved for the treatment of severe nausea and vomiting, for the immediate control o acutely disturbed psychotics, or for patients who cannot be relied upon to take oral medication. (See the monograph on prochlorperazine maleate.)

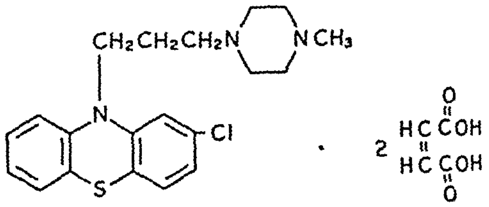
Dosage.—Prochlorperazine ethanedisulfonate i administered orally or by deep intragluteal injection. Oral dosage for adults and children is the same as that outlined in the monograph on prochlorperazine maleate. For severe nausea and vomiting, the usual intramuscular dose for adults is 5 to 10 mg every three to four hours. No more than 40 mg should be injected in any 24-hour period unless the patient is hospitalized and under adequate observation. For control of acutely disturbed patients, the suggested intramuscular dose is 10 to 20 mg. repeated at intervals ranging from one to six hours depending on individual clinical response. For al indications, the usual intramuscular dose for children is 0.10 mg. per pound of body weight. Ora therapy should be substituted as soon as feasible.

Preparations: solution (injection) 10 mg. in 2 cc., 50 mg in 10 cc.; syrup 1 mg. per cc.

Applicable commercial name: Compazine Ethanedisulfonate.

Smith, Kline & French Laboratories cooperated by furnishing scientific data to aid in the evaluation of prochlorperazine ethanedisulfonate.

Prochlorperazine Maleate.—2-Chloro-10-[3-(1-methyl-4-piperazinyl)propyl]phenothiazine dimaleate.—The structural formula of prochlorperazine maleate may be represented as follows:



Actions and Uses.—Prochlorperazine maleate is a phenothiazine compound with actions and uses similar to those of chlorpromazine to which it is related chemically. On a weight basis, prochlorperazine is considerably more potent than chlorpromazine, and comparable therapeutic effects may be achieved with doses which are approximately one-fifth those of the latter agent. The drug produces less adrenergic blockade and consequently less hypotension than does chlorpromazine. It also exerts mild antihistaminic and antispasmodic effects. Unlike chlorpromazine, its potentiating action on other central nervous system depressants is minimal and may be clinically insignificant. The precise mechanism of action, metabolic fate, and excretion of prochlorperazine are not known.

Prochlorperazine maleate is employed for the treatment of those neuroses and mild emotional disturbances in which anxiety, tension, and agitation predominate. The drug is apparently capable of alleviating this type of mental stress and of lessening motor activity in a sizable percentage of patients. Prochlorperazine maleate has also been employed in severe psychiatric disorders such as schizophrenia, mania, involutional psychoses, degenerative conditions, and senile and toxic psychoses. On the basis of subjective observations, the drug appears to be useful in many such cases. Beneficial results ascribed to its action include, among others, reduction in psychomotor agitation and excitement, diminished aggressiveness and destructiveness, loss of hallucinations and delusions, and a general calming effect. The drug has also been used successfully in some cases of psychomotor retardation marked by apathy and lethargy. Prochlorperazine maleate is effectively employed as an antiemetic, and for this purpose it exhibits a potency of about four to five times that of chlorpromazine. Accordingly, it may be used for the control of mild or severe nausea and vomiting due to a variety of causes.

In general, the over-all clinical toxicity of prochlorperazine appears to be somewhat less than that of chlorpromazine. In the usual therapeutic dosage range, side-effects are generally infrequent, mild, and transitory. These include sedation, dizziness, hypotension, tachycardia, and xerostomia. Rarely, a skin reaction, tinnitus, vertigo, nasal congestion, miosis, or gastric hyperacidity may occur. Prochlorperazine also compares favorably with chlorpromazine with respect to the infrequent occurrence of orthostatic hypotension, sedation, and lethargy. To date, no jaundice or blood dyscrasias have been reported; however, in view of the phenothiazine structure of the drug, physicians should be alert to this possibility. On the other hand, neurological sequelae referable to extrapyramidal involvement may be troublesome at higher dosages and not infrequently complicate therapy with prochlorperazine. Symptoms are Parkinsonian-like in character and include spasticity and painful constriction of skeletal muscles, chiefly those of the head, neck, and shoulders. Such effects are most frequent when high doses are used but have occurred with even moderate dosage. Hence, adequate observation of the patient is necessary. If extrapyramidal symptoms appear, they may be controlled by either a downward adjustment of dosage, by the concomitant administration of an antiparkinson drug, or by temporary withdrawal of prochlorperazine.

Dosage.—Prochlorperazine maleate is administered orally. In mild and moderate emotional disturbances and in nausea and vomiting, the oral dose for adults ranges from 5 to 10 mg. three or four times daily. In more resistant cases, the dosage may be increased gradually until symptoms are controlled or side-effects become bothersome. The suggested initial oral dose for the treatment of institutionalized psychotic patients is 30 to 40 mg. per day in divided doses. This is then increased gradually until the desired response has been obtained. The usual effective dose for such patients is 75 to 125 mg. daily.

For infants and children up to 2 years of age, the usual oral dose is 0.25 mg. per pound of body weight one or two times daily but not exceeding a total of 15 mg. per day. Doses of 5 mg. two or three times daily but not exceeding 20 mg. per day may be given to children between the ages of 2 and 6. For children between 6 and 12 years of age, the usual oral dose is 5 mg. two or three times daily, but it should not exceed a total of 25 mg. per day.

Preparations: capsules (sustained-release) 10, 15, and 30 mg.; tablets 5, 10, and 25 mg.

Applicable commercial name: Compazine Dimaleate.

Smith, Kline & French Laboratories cooperated by furnishing scientific data to aid in the evaluation of prochlorperazine maleate.

CAUSAL FACTORS IN HYDRONEPHROSIS.—The author endeavored to determine the causal factors in 104 hydronephrotic kidneys, and he concluded that accessory vessels which constrict the pelvi-ureteric junction or the upper end of the ureter were responsible in half of these cases. In the other half, something that upset the normal muscular action of the renal pelvis or the upper ureter was responsible. In many cases the pelvic musculature appeared to be incapable of normal rhythmic contraction; it contracted in segments and appeared to fibrillate. In many cases the ureter adjacent to the pelvi-ureteric junction appeared to be in persistent spasm, and rhythmic contraction was arrested at this point. Congenital anomalies such as malrotation, horse-shoe kidney or retrocaval ureter accounted for a few cases, but organic stenosis or stricture was seldom responsible. The condition appeared to be bilateral in 50 per cent of cases, although in most instances it was more evident on one side.—J. C. Anderson, O.B.E., T.D., F.R.C.S., The Treatment of Hydronephrosis, *The British Journal of Clinical Practice*, January, 1958.

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OPTIMAL BIRTH WEIGHTS

THE U. S. Department of Health, Education, and Welfare, through the National Office of Vital Statistics of the Public Health Service, has issued a study of births and neonatal deaths by birth weight.[1] The data cover the period 1952-1954, and all but one of the states are represented. This study was made possible by adding an item on birth weight to the birth certificates formerly in use. The addition was made by most states in 1949, and by 1950 nearly all had included it. It thus became possible to obtain extremely valuable information on the relation of mortality to birth weight by matching birth and death records.

One difficulty encountered in this study deserves comment because it so often besets the statistician who tries to work with data supplied by collaborators from other fields. This difficulty, the problem of false modes, is noted by the authors in connection with data on length of gestation periods. A false mode is caused by measurements that appear oftener than they should because of some fault in the way the original observations were reported. In the present study, the information on gestation showed an abnormal frequency of 40-week periods. This must be interpreted to mean that some physicians, reporting births, failed to calculate a period of gestation for newborn infants who appeared to be normally developed. There was also an abnormally high proportion of gestation periods reported as 36 weeks, presumably due to an erroneous conversion from months to weeks by multiplying by 4. It is evident that accurate data on gestation periods will not be available until physicians everywhere, in reporting individual births, are able to supply the actual, instead of the estimated, time in every case.

An important result of the tabulation of mortality against birth weight is the finding that in most states the lowest neonatal mortality occurs in the group of babies weighing between 3,501 and 4,000 Gm. In four states the minimal mortality was in the next heavier group, between 4,001 and 4,500 Gm. Further detailed study would be required to locate the minimum exactly and to tell whether the differences among states had any significance, but it is evident that there exists an optimal birth weight and that it lies nearer to 4,000 than to 3,501 Gm. To locate it more exactly would require more elaborate methods. Moreover, the neonatal mortality (that is, the rate of deaths under 28 days per 1,000 live births) is only one of the possible criteria by which the optimal birth weight could be judged. The point is, however, that the present tabulations suffice to show that an optimal birth weight exists.

The tabulations show that, during the period 1952-1954, the births in the 3,001 to 3,500 Gm. category numbered 4,308,726. This is the largest group, since the corresponding figures for the 3,501 to 4,000 and 2,501 to 3,000 Gm. groups were 3,036,137 and 2,076,134 respectively. It would appear that the modal and optimal groups do no coincide. It is inevitable that many babies will b born before they attain the optimal birth weigh but at first glance these figures seem to indicat that too many babies fail to attain it. There hav been ample warnings, of late, concerning the dangers of elective induced labor and the handicap of the "unfinished child." The problem of defining and locating the optimal birth weight is therefore of great importance. Physicians everywhere can help to solve it by supplying the most accurate data possible when filling out birth certificates.

The data illustrate the fact that prematurity is more frequent, and more important as a cause of fetal wastage, than is postmaturity. Because figures for postmaturity are less abundant, the effects of postmaturity on neonatal mortality have been more difficult to follow statistically. Nevertheless they are important, and the dilemmas that confront the physician when he has to deal with a case of prolonged gestation have been discussed recently by Nesbitt,[2] Kohl,[3] Clifford,[4] and others. A more detailed analysis of the national data on neonatal mortality as related to longer gestation periods and for birth weights exceeding 4,501 Gm. seems desirable. It should afford a valuable guide for physicians in judging the risk involved when babies are overdue.

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[1] Births and Neonatal Deaths by Birth Weight: Reporting Areas, 1952-54, Vital Statistics **47**:1-19 (Dec. 16) 1957.

[2] Nesbitt, R. E. L., Jr.: Postmature Pregnancy—Clinical Obstetric Aspects, J. A. M. A. **165**:1656-1658 (Nov. 30) 1957.

[3] Kohl, S. G.: Oxygen Levels in Postmature Fetus, J. A. M. A. **165**:1659-1662 (Nov. 30) 1957.

[4] Clifford, S. H.: Pediatric Aspects of Placental Dysfunction Syndrome in Postmaturity, J. A. M. A. **165**:1663-1665 (Nov. 30) 1957.

ORGANIZATION SECTION

SAFEGUARDING M.D. CREDENTIALS

Come H-bomb or high water, physicians everywhere will be able to prove their qualifications, under a medical credentials program to be launched at the A. M. A. Annual Meeting next month. The first applications for placing medical credentials in well-protected repositories will be accepted at the World Medical Association's booth in the A. M. A. Scientific Exhibit at San Francisco, from June 23 to 27. At least two repository sites in different parts of the world are contemplated in case one is wiped out in war or other catastrophe.

Doctors will fill out the detailed application blanks in triplicate, attaching passport-type photographs and their thumb prints. These, along with copies of medical school and licensure credentials, will be sent to the WMA secretariat in New York City. There, each set of data will be assigned a file number for the registered physician, and will be stored in a repository. Credentials could be withdrawn through presentation of the file number with proper identification. The cost for physicians between the ages of 25 and 34 is $60 for life. There is a 10-year service rate for older doctors.

Details of the central repository program were announced early this month by Dr. Walter C. Bornemeier, chairman of the WMA's United States Committee for Northern Illinois, at the annual convention of the Student American Medical Association. It was the S. A. M. A. which first suggested a central repository system for credentials. Dr. Bornemeier told the student House of Delegates in Chicago on May 1:

"Unless the doctors of the world avail themselves of this service, your resolution and the four years spent in implementing it become meaningless. I would like to suggest that you consider appointing a permanent committee to develop and promote a satisfactory educational program for informing every future doctor of the untold value he may realize by depositing copies of his professional credentials in the central repository.

"As you know, during World War II and the recent Hungarian tragedy hundreds of doctors left their countries. Their medical credentials were lost or destroyed. Today many of them are laborers, research assistants or hospital service personnel because they have no means of proving that they are medically trained and fully accredited to practice medicine. Even in a holocaust less frightful than war your credentials might be lost or stolen and you would find it difficult or greatly inconvenient to replace them."

Dr. Louis H. Bauer, secretary general of the WMA, which is a confederation of 53 national medical associations representing more than 700,000 physicians throughout the world, has said: "Success in this one program alone—a central repository for medical credentials—would justify the existence of WMA."

Other WMA objectives include promotion of a freer medical practice; support of freely functioning medical practice; establishment of national medical organizations where none exist; promotion of medical research; universal adoption of a special emblem that will identify and protect civilian medical units in time of armed conflict; the monitoring of activities of more than 23 other international organizations as they affect the practice of medicine; formulation of principles of cooperation among practicing physicians and public health officers; and sponsorship of world conferences on medical education.

NEW A. M. A. PUBLICATIONS

Pamphlets on "Health Aspects of Aging" and on "Suggested Guides to Relationships Between Medical Societies and Voluntary Health Agencies" now are available for distribution to physicians and other interested individuals. Mailing began late in April.

The booklet on aging, prepared by the A. M. A. Committee on Aging under the Chairmanship of Henry B. Mulholland of Charlottesville, Va., is a compilation of articles which appeared as a series in The Journal during the past year. Each author is a recognized authority on the subject selected, and has endeavored to minimize technical terminology in order to gain acceptance by a large number of readers.

The A. M. A. Committee on Relationships Between Medicine and Allied Health Agencies, whose Chairman is Sidney J. Shipman of San Francisco, prepared the other pamphlet as a revision of a draft which also had appeared in The Journal. An introduction of these "Suggested Guides" takes note of the widespread growth of voluntary health agencies, and it adds:

"Physicians, because of their special training, recognize they have a singular responsibility as guardians of the individual's and nation's health. Physicians also recognize a national emotional response by individuals toward pleas for help to aid the unfortunate. There comes a time, however, when those activities which arouse natural emotional responses should have some evaluation and guidance."

Copies of either or both of the two pamphlets may be obtained from the Council on Medical Service, American Medical Association, 535 N. Dearborn St., Chicago 10.

DR. ROBERT E. WILSON HONORED FOR AID TO MEDICAL EDUCATION

Medical Education Week was highlighted in the Chicago area April 21, at a luncheon in the Drake Hotel honoring Robert E. Wilson, Sc.D., LL.D., retired chairman of the Standard Oil Company (Indiana), for his leadership in developing aid-to-medical-education programs among corporations. The luncheon, sponsored by the Association of American Medical Colleges, the National Fund for Medical Education, and the American Medical Association, was attended by 250 corporation executives, physicians, and medical educators.

Pictured are, *left to right,* Drs. George F. Lull, President, American Medical Education Foundation, Robert E. Wilson, Stanhope Bayne-Jones, and F. J. L. Blasingame, General Manager of the American Medical Association.

Dr. Wilson, in accepting a citation of merit presented by Lowell T. Coggeshall, M.D., AAMC president, estimated that American industry's gifts to health, education, and welfare totaled more than half a billion dollars last year. He said the financial needs of higher education is a joint responsibility of industry, the government, foundations, and the public. "We should consider the difference between what we are doing and what we should be doing—or the difference between what we have in the way of health and security and what we could do," he said.

Dr. David D. Henry, president of the University of Illinois, presided at the luncheon and introduced the principal speaker, Stanhope Bayne-Jones, M.D., chairman of the Secretary's Consultants on Medical Research and Education of the U. S. Department of Health, Education, and Welfare.

Dr. Bayne-Jones warned that low faculty salaries are weakening the basic science departments of the nation's medical schools, and the situation in the medical schools is particularly serious at this time because of the added pressures on the schools resulting from the current revolution in science through the study of the atom, the cell, and nuclear physics.

"It may be predicted that this trend will continue, and at an increased rate as new schools are developed, if salaries of teachers in these departments fail to maintain a reasonable matching of salaries paid in competitive organizations," he said.

The luncheon was part of the nationwide observance of Medical Education Week, April 20-26, sponsored by medical schools and state and county medical societies.

"WIDE WIDE WORLD" COMMENDED

The Board of Trustees of the American Medical Association has commended the National Broadcasting Company and its Sunday afternoon feature, "Wide Wide World," for its program on American doctors. This program presented "The House I Enter," the story of American doctors, on Sunday, Oct. 27, 1957.

The Board commendation read: "Through the miracle of television, 'Wide Wide World' took a vast audience of televiewers around the country to see the work being done by doctors in various types of medical practice. The medical profession is grateful for this opportunity to report its activities to the American people."

A special citation was also issued to Ted Rogers, who produced the show. "Wide Wide World" is sponsored by General Motors and is seen over the full NBC television network each Sunday from 4:00 p. m. to 5:30 p. m. EST.

CHANGE OF ADDRESS

If you change your address please notify THE JOURNAL at least six weeks before the change is made. Include the address label clipped from your latest copy of THE JOURNAL, being sure to clearly state both your old and new address. If your city has Postal Zone Numbers, be sure to include this Zone Number in your new address.

MEDICAL NEWS

ILLINOIS

Hospital Lecture.—The final lecture in the eighth annual North Shore Hospital lecture series on Emotional Problems of Childhood will be held June 4, 8 p. m., on "Management of the Emotional Problems of the Physically Handicapped Child," by Dr. William Cooper, assistant professor of clinical surgery, Cornell University Medical School, New York City. The Commission on Education of the American Academy of General Practice has approved these lectures for category II credit.

Appoint Director of University Health Service.—Dr. Orville S. Walters, of Danville, has been named director of the University of Illinois Health Service. Dr. Walters, staff psychiatrist at the Hospital in Danville, will take over his new duties Aug. 1. He was president of Central College, McPherson, Kan., from 1939 to 1944, when he entered private practice. In 1953 he became associated with the Veterans Administration. Dr. Walters succeeds Dr. Lester M. Dyke, who resigned last year to become head of the health service at University of Maryland, Baltimore.

Chicago

Dr. Newman Honored.—Dr. Louis B. Newman, chief of the physical medicine and rehabilitation service, VA Research Hospital, recently received the "Civil Servant of the Year" award from the Federal Personnel Council and Regional Council of Federal Agencies. He was selected from among 70,000 civil service employes in the Chicago area. Dr. Newman is president-elect of the American Academy of Physical Medicine and Rehabilitation and is on the executive committee, Section on Physical Medicine, American Medical Association.

Dustfall in Chicago.—The Armour Research Foundation of the Illinois Institute of Technology, in its report of the amount and chemical analysis of the dustfall for Chicago for March, has announced that the average dustfall at its 25 stations, including the Loop, was 45.6 tons per square mile per month of 30 days. Of this amount 23.4 tons were water insoluble constituents and 22.2 tons were water soluble constituents. The "Loop Average" total dustfall was 94.6 tons per square mile. The least amount of dustfall was 21.8 tons per square mile at a station in the near-north section of the city.

Gastroenteritis in a Hospital.—The U. S. Public Health Service's Morbidity and Mortality Weekly Report, released May 2, notes that Dr. Olga G. Brolnitsky, Chicago Board of Health, reported an outbreak of gastroenteritis in a hospital where 51 persons became ill with nausea, vomiting, cramps, and diarrhea, three to seven hours after eating a luncheon of tuna-fish salad. Of the 51 food handlers investigated, Salmonella was recovered from the stools of two persons, Shigella from the stool of another, and coagulase-positive Staphylococcus was cultured from the throats of four others. These seven employees were removed from their jobs and hospitalized.

Grant to Insure Salary Until Retirement.—The American Cancer Society has made a grant to the University of Chicago of $587,344, specifically allocated to pay the salary until he reaches retirement age of 34-year-old Dr. Paul Talalay, associate professor of biochemistry in the university's Ben May Cancer Research Laboratory. According to *Tower Topics*, published by the university for its alumni, the grant is part of a program designed "to lure the most brilliant young scientists in the country to fight cancer." It is said to be probably the largest grant ever awarded to a single individual by a voluntary agency. Dr. Talalay's earlier discovery and isolation of enzymes involved in the utilization of sex hormones by the body won him the Theobold Smith Award in Medical Sciences.

Dr. Huggins Receives German Honor.—Dr. Charles B. Huggins, director of the Ben May Laboratory for Cancer Research of the University of Chicago's medical and biological research center, has been named to membership in the Order of Pour le Merite by the German Federal Republic. Founded by Frederick the Great as a military honor, it now provides recognition in the sciences and arts, with membership in the group limited to 30. Thornton Wilder, author and playwright, and Arthur H. Compton, physicist, are the only two other American members. President Theodor Heuss of the German Federal Republic will install Dr. Huggins and the other newly elected member, Dr. Georg von Hevesy, professor of chemistry and physics in the Universities of Copenhagen and Stockholm, in a ceremony at Bonn July 7.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

MASSACHUSETTS

Grant for Study of Birth Process.—A grant of $400,000 to the Harvard Medical School and the Boston Lying-In Hospital for basic studies in problems surrounding the origin of life and the birth process has been made by the Association for the Aid of Crippled Children. The grant is in addition to $371,000 previously voted by the association to support work in the same general area at the university. The money will be available over a 10-year period and will support a coordinated program of research and teaching devoted especially to problems associated with the beginning and early development of human life. Dr. Duncan E. Reid, professor of obstetrics, Dr. Clement A. Smith, associate professor of pediatrics, and Claude A. Villee, Ph.D., associate professor of biological chemistry, will be responsible for the program.

Dr. Malamud Named Research Director.—Dr. William Malamud will resign as chairman of the division of psychiatry at Boston University School of Medicine and as psychiatrist-in-chief at the Massachusetts Memorial Hospital, Sept. 1, to accept the post of research director for the National Association for Mental Health. Under Dr. Malamud's direction the NAMH research committee will allocate grants to research scientists investigating the cause, treatment, and prevention of mental and emotional ailments. The new program will be supported at first by a minimum allocation of 5% of the association's annual fund-raising campaign receipts. Dr. Malamud's career includes professorships at the University of Iowa, Iowa City, and Tufts Medical School, Boston. He is secretary of the American Psychiatric Association; director of research, Scottish Rite and National Association for Mental Health Committee on Schizophrenia Research; director, American Board of Psychiatry and Neurology; and consultant to the Ohio State Department of Mental Hygiene and the Boston Veterans' Hospital.

MICHIGAN

Appoint Professor of Physical Medicine.—Dr. Joseph N. Schaeffer has been appointed as special professor of physical medicine, Wayne State University, Detroit. A new department of physical medicine was created at the College of Medicine when his appointment became effective May 3. Dr. Schaeffer, of Peoria, Ill., was recently named director of the Rehabilitation Institute of Metropolitan Detroit. He served as a medical officer in the Air Force from 1942 to 1953. He is a diplomate of the American Board of Physical Medicine and Rehabilitation.

Personal.—Dr. Archer A. Claytor, of Saginaw, has received notice of his appointment to the board of directors of the Virgin Islands Corporation, announced Jan. 25 by President Eisenhower. Virgin Islands Corporation is a government corporation which promotes development of industry and trade in the islands. Among other things, it is engaged in sugar production, electric power production, promotion of tourist trade, and soil and water preservation.——Dr. Austin W. Heine, Mount Clemens, has been awarded the American Legion's Citizen of the Year award for "outstanding service to the community, state and nation."

MINNESOTA

Medical School Admissions to Increase.—Admissions to the University of Minnesota Medical School, Minneapolis, will be increased from 125 to 140 students for the next school year (1958-1959) and to 150 in 1959, Dr. Robert B. Howard, associate dean, has announced. By 1962, the four medical school classes will have a combined total enrollment of about 600, as compared with under 500 at present. Enlarged laboratory facilities and strengthening of the staffs of the university's basic medical sciences departments are the principal factors which permit the increases.

University News.—Dr. Takeo Hayashida, a member of the surgical faculty of the University of Tokyo, visited the Mayo Clinic and Mayo Foundation at Rochester Jan. 20-23, observing intracardiac surgical procedures and clinical and experimenal vascular surgery. On returning to Japan, he will become head of a new department of intracardiac and vascular surgery.——Dr. Grant H. Lathe, of the department of chemical pathology, University of Leeds School of Medicine, England, discussed recent work on the chemistry of jaundice at the Mayo Clinic and Mayo Foundation, Rochester, March 12

MONTANA

Annual Conference at Missoula.—The annual Western Montana Medical and Surgical Conference, sponsored by the Western Montana Medical Society, will be held June 28 at the Hotel Florence, Missoula. Dr. Eugene J. P. Drouillard, president of the society, will open the meeting with an address. Two panel discussions are scheduled: "The Cytologic Diagnosis of Uterine Cancer" and "Some Blood Disorders in General Practice," moderated by Drs. Glenn A. Carmichael and Bryce D. Colwell, of Missoula, respectively. The following will be presented by guest speakers:

Ovarian Tumors, Dr. Clifford L. Fearl, Portland, Ore.
Leukemia, Dr. Claude E. Forkner, New York City.
Uterine Bleeding, Dr. Fearl.
The Philosophy for the Practice of Medicine, Dr. Forkner

The program has been submitted for eight hours of credit by the American Academy of General Practice. A program of ladies' activities is arranged. For information write the Western Montana Clinic, Owen and West Broadway, Missoula, Mont.

NEW YORK

Dr. Vaughan to Head Immunology Program.—Dr. John H. Vaughan, on the medical faculty of the Medical College of Virginia, Richmond, will join the University of Rochester School of Medicine and Dentistry July 1 to head a new training and research program in clinical immunology. Dr. Vaughan has been appointed associate professor of medicine and assistant professor of bacteriology and immunology in the Medical School, and senior associate physician in Strong Memorial Hospital. Four of Dr. Vaughan's research associates will move from Richmond to Rochester with him: Dr. and Mrs. Richard W. Dutton, of London, England; Dr. Mariam George, of Bombay, India; and Dr. Jean L. Harris.

Three Named Professors at Rochester.—Three members of the University of Rochester Medical School faculty who have been on the department of medicine faculty for 30 years or more have been promoted to full professors: Dr. Lawrence A. Kohn, first chief resident in medicine at the Medical Center when it was opened Jan. 21, 1926, named clinical professor of medicine, the first to be given that title; Dr. Ernest H. Keutmann, who came to the Medical Center as an intern in Strong Memorial Hospital in 1928; and Dr. Paul H. Garvey, who has been in charge of the neurology section since 1928. Dr. Kohn (in 1956) and Dr. Garvey (in 1957) have been awarded the Gold Medal of the Medical School Alumni Association for "inspiring teaching, integrity, and devotion to students." Dr. Kohn came to Strong Memorial Hospital in 1925 as an instructor in medicine. He became an assistant professor (1929) and associate professor in the Medical School and associate physician in Strong Memorial Hospital (1941). In 1956 he received the Award of Merit of the Rochester Academy of Medicine. Dr. Garvey came to the Medical School as an instructor in medicine from the University of Michigan, Ann Arbor, where he had been an instructor in neurology. He was promoted to assistant professor and assistant physician in 1930, and to associate professor and associate physician in 1937. Dr. Keutmann was appointed an assistant in medicine and assistant resident physician in 1929 and rose to instructor and resident physician in charge of the medical outpatient department in 1930, assistant professor of medicine and pharmacology in 1947, and associate professor in 1948.

New York City

Personal.—Dr. Howard A. Rusk of the department of physical medicine and rehabilitation, New York University-Bellevue Medical Center, was recipient of a bronze plaque "for his services to the mentally retarded" at the annual dinner of the Association for the Help of Retarded Children May 18.——Dr. William E. Studdiford, professor emeritus of obstetrics and gynecology, New York University College of Medicine, received the New York University presidential citation at a reception in his honor April 11. The presentation was made "in recognition of Dr. Studdiford's outstanding services to the University and for his high professional attainment within his specialty prior to his retirement in September, 1956, as professor and chairman of the department of obstetrics and gynecology."——Dr. Frank G. Boudreau, who received the Albert Lasker Award in 1957 for "outstanding contributions in public health administration," has been elected president of the National Vitamin Foundation.

OHIO

State Medical Election.—The Ohio State Medical Association has installed the following officers: Dr. George A. Woodhouse, Pleasant Hill, president; Dr. Frank H. Mayfield, Cincinnati, president-elect; and Dr. George J. Hamwi, Columbus, reelected treasurer for a three-year term. The following were elected to the Council for the first time: Dr. Charles W. Hoyt, Cincinnati, first district, and Dr. Floyd M. Elliott, Ada, third district. The 1959 meeting will be held in Columbus the week of April 19.

Plan Memorial for Dr. Paryzek.—Staff members at St. Alexis Hospital, Cleveland, and friends are planning a memorial to Dr. Harry V. Paryzek, who was president of the Ohio State Medical Association in 1941-1942. The memorial is to be a $125,000 penthouse conference room atop the five-story service wing which is to be built with the proceeds of the St. Alexis Hospital Million Dollar Building Improvement Fund Campaign. Dr. Harold J. Barker is chairman of the memorial committee. Dr. Paryzek, who served in Europe during World War I, became director of medicine at St. Alexis Hospital and chief of staff in 1930. In 1933 he was president of the Cleveland Academy of Medicine, and at the time of his death was chairman of the state medical association's Committee on Chronic Illness. For information write The Harry V. Paryzek Memorial Fund, c/o St. Alexis Hospital, 5163 Broadway, Cleveland 27.

OREGON

Bacteria in Cream-Filled Doughnuts.—The U. S. Public Health Service's Morbidity and Mortality Weekly Report, released May 2, notes that Dr. Samuel B. Osgood of the Oregon State Board of Health, reported an outbreak of gastroenteritis in four persons in a family after eating cream-filled doughnuts from a bakery. A 5-day-old doughnut obtained from the home had a bacterial count of 850,000,000 per gram, while a fresh doughnut from the bakery had a bacterial count of 6,200,000 per gram. The bakery discontinued making cream-filled products, and all of their equipment was disinfected.

PENNSYLVANIA

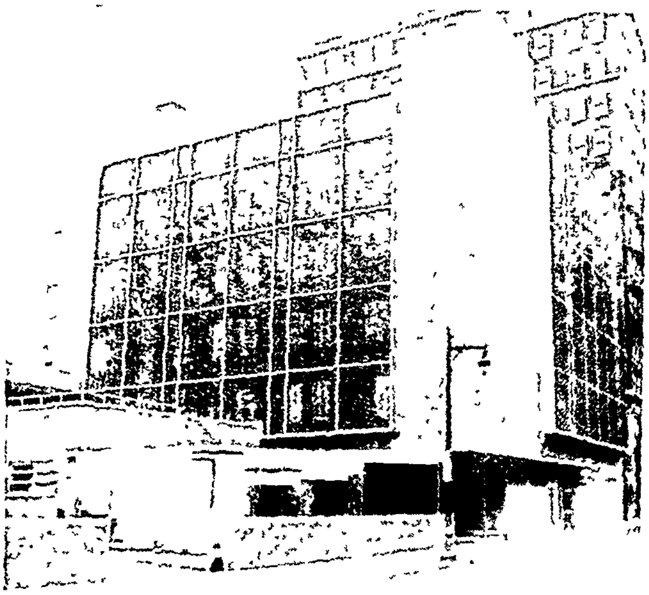
Hospital News.—A suite of climate-simulating rooms being constructed for Lankenau Hospital, Overbrook, will enable scientists to study body metabolism. The suite will consist of three rooms with minutely controlled temperatures and humidities. Costing $105,000, it will be shipped in knocked-down state from New Jersey for installation in the first floor of a six-story research wing now being erected at the hospital.

Campaign to Endow Chair in Biochemistry.—A half-million-dollar campaign to endow a chair of biochemistry in honor of Dr. William S. McEllroy, retiring dean of the University of Pittsburgh School of Medicine, is under way by alumni of the school. Dr. McEllroy will retire as dean June 30 after 41 years of service to the university. He will retain his academic rank as professor of biochemistry and also will serve as an advisor on medical affairs. Dr. John E. Weigel, assistant professor of surgery and general chairman of the campaign, announced that $100,000 of the needed funds already is available from gifts by medical alumni. The remaining $400,000 will be raised principally through personal solicitation by alumni who have volunteered to assist in the campaign. Dr. McEllroy joined the Pitt medical faculty in 1917 and became dean in 1939 after having served as assistant dean from 1921 until that time.

Philadelphia

Dr. Babcock Feted at Surgical Society Dinner.—Dr. W. Wayne Babcock, emeritus professor of surgery, Temple University School of Medicine, was guest of honor at the commemoration of the 50th anniversary of The Babcock Surgical Society, oldest student organization at the school. Among the guests was Dr. David B. Allman, President, American Medical Association, who spoke on "Medical Education." Other guests included Robert L. Johnson, LH. D., president, Temple University; Dr. William A. Steel, emeritus professor of the principals of surgery at Temple and first president of the Babcock Surgical Society; Dr. William N. Parkinson, dean of the Medical School; and Dr. Robert A. Bucher, associate dean. Senior medical student John A. Udall, current president of the honor society, was toastmaster. Dr. Babcock, who served as head of the department of surgery at Temple University School of Medicine from 1903 until his retirement in 1943, was succeeded by Dr. W. Emory Burnett. In 1954, Dr. Babcock was awarded the American Medical Association's Distinguished Service Medal.

Dedicate Hospital for Rehabilitation.—The Magee Memorial Hospital for Convalescents was opened with formal ceremonies March 9. A five-story, air-conditioned, 78-bed building, it will furnish services for the rehabilitation of physically disabled patients of all income groups, races, and religions over the age of 14 years who are residents of metropolitan Philadelphia. The hospital was established with a 7-million-dollar trust fund left by Miss Anna J. Magee. The cost of the hospital and equipment was about 2.5 million dollars; income from the remaining funds will be used to support free and part-pay beds. The hospital is controlled by representatives of 11 general hospitals of the city including the four large medical school hospitals (Hahnemann, Jefferson, Temple, and University of Pennsylvania). Dr. Henry F. Parry is director of the institution.



The recently dedicated Magee Memorial Hospital for Convalescents.

Select New Dean at Jefferson Medical College.—The board of trustees of Jefferson Medical College has named Dr. William A. Sodeman dean of the college, to succeed Dr. George A. Bennett, who died in February. Dr. Sodeman is the Magee Professor of Medicine and head of the department of medicine at Jefferson. He is certified by the American Boards of Internal Medicine and Preventive Medicine. He was previously a member of the executive faculty of the Tulane University Medical College, New Orleans, and a professor of medicine at the University of Missouri Medical School, Columbia. Dr. Sodeman is a past-president of the American Society of Tropical Medicine.

"American Way" Tour for Foreign Physicians.—Physicians from 34 foreign countries who are furthering their medical education at the University of Pennto Dr. Fred T. Burling, New York State School of Industrial and Labor Relations, Cornell University, Ithaca, N. Y.

Card for Patients on Anticoagulant Therapy.—An "emergency" identification card for the protection of patients on long-term anticoagulant therapy is now available to physicians from the American Heart Association and its affiliates. The card, designed as a wallet insert, was developed as a result of requests from physicians seeking to protect their patients on anticoagulants in case of accident, dental surgery, or other treatment that may induce bleeding. It points out that the bearer "is being treated with anticoagulants which slow down clotting of the blood." In case of emergency—bleeding, injury or illness—the card advises that a doctor be called, since the patient may require an antidote. The card has space to indicate the kind of anticoagulant prescribed and the patient's blood type. Physicians may obtain samples of the card from their local heart association or from the American Heart Association, 44 E. 23rd St., New York City.

Rehabilitation Fellowships for Venezuelans.—A program to supplement Venezuela's medical facilities and techniques for rehabilitating the crippled and handicapped has been announced by Mr. Percy C. Spencer, LL.B., president of Sinclair Oil Corporation, through its Venezuelan affiliate, Sinclair Venezuelan Oil Company. Fellowships will be established to enable a selected group of Venezuelan doctors, nurses, physical therapists, social workers, and prosthetic technicians to obtain further training and experience at the Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center and other rehabilitation centers in the United States. The program will be administered by the World Rehabilitation Fund and its president, Dr. Howard A. Rusk, chairman, department of physical medicine and rehabilitation at the medical center. Dr. Rusk has helped establish rehabilitation programs in some 36 countries, principally through the International Society for the Welfare of Cripples, a nongovernmental organization.

Northwest Meeting of Plastic Surgeons.—The 1958 meeting of the Pacific Northwest Society of Plastic and Reconstructive Surgery will be held May 23-24 in Tacoma, Wash. Three movies are planned: "Control of Hemorrhage," presented by Dr. Walter S. Brown, Seattle, and "Mammaplasty" and "Motivation in Overcoming Handicaps," presented by Dr. David E. Sullivan, Spokane, Wash. Program topics and speakers include:

Homograft Survival, Dr. Cyrus G. Pow, Vancouver, British Columbia, Canada.
Ectopic Salivary Tumor of Upper Lip, Dr. Robert J. Cowan, Vancouver, B. C.
T[illegible] E[illegible] Badre, Vancouver, B. C.
Reduction of the Hypertrophied Breast, Dr. Charles E. Gurney, Portland, Ore.
Complications in the Care of Major Burns, Dr. Edward E. Wayson, Portland, Ore.
Correction of the Deformed Mucocutaneous Angle, Dr. Adalbert G. Bettman, Portland, Ore.

For information write the Pacific Northwest Society of Plastic and Reconstructive Surgery, 419 Mayer Building, Portland 5, Ore.

Decrease in Mental Patients.—Despite an increase in admissions, the population of U. S. mental hospitals continued to decline in 1957, a survey released by the American Psychiatric Association and the National Association for Mental Health has disclosed. It marked the second year of downtrend in mental hospital rolls after a 25-year climb. Admissions during 1957 increased by 5.6% while discharges increased by 9.2%. With other factors, including a 2.4 reduction in mental hospital deaths. the net drop in population amounted to one half of one per cent in state, county, and veterans' mental hospitals, sustaining a "turning point" which started in 1956. During 1957, expenditures per patient were increased from $3.27 a day to $3.64 a day. Full-time employes in public mental hospitals rose from 153,715 to 162,885, an increase of 6%. Last year 23 states increased their appropriations per patient by more than 10% and 12 increased the amount by more than 15%. Kentucky spent 57.5% more per patient than in the previous year, bringing up the figure to $3.25 a day, and increased the number of full-time personnel per 100 patients by 42.3%, or from 21.3 employees per 100 patients to 30.3.

Plague in Rodents.—Mr. F. M. Prince, Public Health Service San Francisco Field Station, has reported the isolation of *Pasteurella pestis* from the following specimens collected in Klamath County, Oregon:

Specimen 663—One *Microtus montanus* (field mouse) found dead, Jan. 26, five miles northwest of Klamath Falls.
Specimen 688—One *M. montanus* found dead, Jan. 26, six miles northwest of Klamath Falls.
Specimens 872 and 893—*Citellus beldingi oregonus* (ground squirrel), one found dead and one trapped, March 6, twelve miles east of Klamath Falls.

The recent isolations were from rodents collected in an investigation of an explosive buildup of the *Microtus* population which was first noted last fall in Klamath County. The density of this population reached as high as 10,000 per acre in some areas and remained at an abnormally high level during the past winter. Of a limited number of samples of mice a high proportion was found to have tularemia. Only one confirmed case of human plague has ever been reported in Oregon. This was in a sheepherder employed in Lake County which is adjacent to Klamath. He developed plague and died in 1934. A suspect case in another sheepherder occurred in 1943 in Harney County.

Traffic Deaths Decrease for March.—Cities led the way to the lowest March traffic death toll since 1955, the National Safety Council has reported. The March tally of deaths was 2,630 for the nation, a reduction of 9% from the March level a year ago. Cities of 10,000 population or more achieved a 14% reduction. Traffic deaths totaled 2,890 in March last year, the council said. In 1955, the toll was 2,602. March was the fifth month in a row and the 15th out of the last 16 in which traffic deaths totaled the same or fewer than in the corresponding months of the previous year. For the first quarter of the year, the death toll was 7,730—down 6% from last year's 8,250.

Grant for Study of Mental Hospital Programs.—The Southern Regional Education Board has received a grant which will enable staff members of Southern mental hospitals to observe new or unusual programs in other hospitals, starting June 1. The grant was made by the National Institute of Mental Health in the amount of $42,000 for the 1958-1959 period and $48,000 for the 1959-1960 period. The grants to hospital staff members will vary with each request and will be made according to the need in each case but will not exceed $500. Applications must be made to the board through the head administrator of the applicant's hospital.

Foundation for Research in Parkinson's Disease.—Announcement has been made of the establishment of a foundation for research into the cause and cure of Parkinson's Disease and related disorders. The officers of the Parkinson's Disease Foundation, Inc., include Mr. William Black, president; Dr. Edgar A. Lawrence, treasurer; Mr. Lawrence Valenstein, secretary; Dr. H. Houston Merritt, chairman, research advisory board; and Dr. Melvin D. Yahr, medical director. The offices of the foundation are at 125 E. 50th St., New York 22. Grants will be made to assist the work of investigators in this field. Application blanks are now available at the offices of the foundation and, when submitted, they should be addressed to Dr. Yahr.

International Surgeons Elect Officers.—Prof. Dr. Raffaele Paolucci diValmaggiore, head, surgical clinic, University of Rome, Italy, has been chosen president-elect of the International College of Surgeons, to be installed in September, when Dr. Henry W. Meyerding, Rochester, Minn., will become president to succeed Prof. Dr. Carlos Gama, of Sao Paulo, Brazil. Other international officers elected are: first vice-president, Dr. Lyon H. Appleby, Vancouver, B. C., Canada, and the following vice-presidents from the U. S.: Drs. Alexander Brunschwig, New York City; Edward L. Compere, Chicago; Arnold S. Jackson, Madison, Wis.; and Francis L. Lederer, Chicago. International secretary general is Dr. Max Thorek, Chicago; treasurer, Dr. Clement L. Martin, Chicago, and executive director, Dr. Ross T. McIntire, Chicago.

Scientific Tape Recordings Available.—A catalog of tape-recorded scientific lectures by recognized medical authorities has been prepared under the auspices of the Commission on Medical Education and Licensure of the Indiana State Medical Association. These tapes, recorded at 3¾ IPS, include medical forums, and such subjects as cardiovascular and peripheral-vascular diseases, cancer, obstetrics and gynecology, psychiatry, pediatrics, and treatment. Instructions for loan or purchase of tapes by members and nonmembers of the state society can be found on the first page of the catalog entitled "Learning Through Listening." Copies of the catalog and tapes are available from: Indiana State Medical Association, 1021 Hume Mansur Building, Indianapolis 4, Ind.

Nutritionists Receive Awards.—At a dinner commemorating the 25th anniversary of the founding of the American Institute of Nutrition, Lemuel D. Wright, Ph.D., professor of nutrition, Cornell University, Ithaca, N. Y., was awarded the 1958 Borden Award in Nutrition ($1,000 and a gold medal), and The Osborne and Mendel Award ($1,000) was presented to Dr. Paul Gyorgy, pediatrician-in-chief at the Hospital of the University of Pennsylvania, Philadelphia. Before joining the staff of Cornell, Dr. Wright was a research associate at Merck, Sharp and Dohme Research Laboratories. Dr. Gyorgy, discoverer of riboflavin and of vitamin B_6, is a native of Hungary. The Borden Award in Nutrition is given annually by the Borden Company Foundation, Inc.; the Osborne and Mendel Award by the Nutrition Foundation, Inc.

Fellowships in Industrial Psychiatry.—To meet the need for industrial psychiatrists in major American industrial firms, the Carnegie Corporation of New York has granted support for Cornell fellowships of two years duration. One academic year is spent in residency at Cornell's New York State School of Industrial and Labor Relations, with individualized course work in industrial human relations, personnel problems, preventive mental health programs, etc. The second year is spent in a supervised internship at a selected business or industrial company. The total program is approved as one-year residency in psychiatry. The stipend is $5,250 for the first year and, with satisfactory performance, $5,750 for the second year. To be eligible for the fellowships applicants must have completed a minimum of two years residency in psychiatry. For information write

Tervoort, of the School for the Deaf, St. Michielsgestel, The Netherlands, will also speak. Of special interest to parents will be a one-day session devoted to the organization of the newly formed parents' section of the association. Under the chairmanship of William G. Hardy, Ph.D., director, Hearing and Speech Center, Johns Hopkins Hospital, Baltimore, parents will elect officers and plan action to improve the education of deaf children. The Alexander Graham Bell Association for the Deaf is an organization to promote teaching of speech and lipreading to the deaf.

FOREIGN

Congress on **Child Psychiatry.**—The fourth International Congress for Child Psychiatry, under the auspices of the Portuguese Government, will be held June 15-20 at the Medical School Hospital of Santa Maria, Lisbon, Portugal. Official languages will be French, English, German, and Portuguese with simultaneous translation provided in the plenary sessions. Subject for the congress is "The Psychological Problems of Children Between the 6th and the 10th Year of Age," and will be dealt with under the following division headings: (1) emotional lack in children between 6 and 10, (2) teamwork in child psychiatry, (3) the formation of child psychotherapists, (4) psychotherapeutic methods, (a) infantile analyses, (b) individual psychotherapy. Afternoon discussion groups of limited membership will consider the following:

Clinical problems in relation to psychotherapeutic methods.
External relations of the child guidance team (cooperation with pediatrists, schools, jurisdictional services for minors, social services, etc.; methods of preventive mental hygiene).
Diagnostic terminology.
Institutions for the treatment of irregular children.
Group therapy for children.
Relations of children with their families.
Psychotherapy and psychosomatic problems.
Emotional problems and the psychological care of sick children.
Children and school.

Fees are $15 for associate members and $5 for accessory members. For information write the General Office, Instituto A. A. Da Costa Ferreira, Travessa Terras Santana, 15, Lisbon, Portugal.

Congress on **Allergology in Paris.**—The third International Congress of Allergology will be held in the New Medical School, Paris, Oct. 19-25, sponsored by the International Association of Allergology, under the presidency of Dr. Samuel M. Feinberg, Chicago, and by invitation of the French Allergy Association. The program will include symposiums on asthma and emphysema, physic-chemical properties of allergic antibodies, recent advances in phases of clinical allergy, biochemical aspects in hypersensitivity, a round-table conference on autoimmune reactions, a discussion of allergy management and problems in different parts of the world (including socioeconomic aspects), and a demonstration of special techniques in clinical and experimental allergy. Participants will include Sir Henry Dale and Pasteur Vallery-Radot. For information write Dr. Bernard Halpern, 197 Boulevard St., Germain, Paris VII°, France. A post-convention tour is also being planned. The social aspects of the Congress will include a reception and party at the Louvre Museum, an evening at the opera (ballet), conducted tours, and a party at the Medical School.

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: The American medical qualification examination to be given henceforth twice a year for foreign medical graduates. Medical Schools in the United States and Foreign Countries, Sept. 23. Final date for filing application is June 23. Executive Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Illinois.

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: *Written. Parts I and II.* All medical centers in the United States and Canada, June 17-18. Sec., Dr. John P. Hubbard, 133 S. 36th St., Philadelphia.

BOARDS OF MEDICAL EXAMINERS

Alabama: *Examination.* Montgomery, June 17-19. Sec., Dr. D. G. Gill, State Office Building, Montgomery 4.

Arizona:° *Examination.* Phoenix, July 16-18. *Reciprocity.* Phoenix, July 19. Sec., Dr. Thomas N. Bate, 826 Security Bldg., Phoenix.

Arkansas:° *Examination.* Little Rock, June 5-6. Sec., Dr. Joe Verser, Harrisburg.

California: *Written Examination.* San Francisco, June 16-19; Los Angeles, August 18-21; Sacramento, Oct. 20-23. *Oral Examination.* San Francisco, June 14; Los Angeles, August 16; San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

Colorado:° *Examination and Reciprocity.* Denver, June 10-11. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

Connecticut:° *Examination.* Hartford, July 8-10. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven.

Delaware: *Examination and Reciprocity.* Dover, July 8-10. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

Florida:° *Examination.* Miami, June 29-July 1. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami.

Georgia: *Examination.* Atlanta and Augusta, June 11-12. *Reciprocity.* Atlanta, June 13. Sec., Mr. C. L. Clifton, 224 State Capitol Bldg., Atlanta.

Idaho: *Examination.* Boise, July 14-16. Exec. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

Illinois: *Written Examination.* Chicago, July 7-11. *Oral*

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	April 26, 1958		April 27, 1957 Total
	Paralytic Type	Total Cases	
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	..	..	..
Middle Atlantic States			
New York	..	..	..
New Jersey	..	..	..
Pennsylvania	..	..	1
East North Central States			
Ohio	..	..	1
Indiana	..	1	..
Illinois	..	..	..
Michigan	1	1	1
Wisconsin	..	..	1
West North Central States			
Minnesota	..	..	..
Iowa	..	..	..
Missouri	..	..	..
North Dakota	..	..	1
South Dakota	..	..	..
Nebraska	..	..	1
Kansas	..	1	1
South Atlantic States			
Delaware	..	..	..
Maryland	..	..	..
District of Columbia	..	..	..
Virginia	..	..	1
West Virginia	..	..	..
North Carolina	..	..	..
South Carolina	..	..	1
Georgia	..	..	..
Florida	..	1	4
East South Central States			
Kentucky	1	3	2
Tennessee	1	1	1
Alabama	..	..	1
Mississippi	..	1	..
West South Central States			
Arkansas	..	..	1
Louisiana	..	..	3
Oklahoma	..	..	..
Texas	2	4	6
Mountain States			
Montana	..	..	..
Idaho	..	..	1
Wyoming	..	..	..
Colorado	..	..	1
New Mexico	..	..	1
Arizona	..	..	3
Utah	..	..	1
Nevada	..	..	..
Pacific States			
Washington	..	..	..
Oregon	..	..	1
California	1	1	13
Territories and Possessions			
Alaska	..	..	..
Hawaii	2	2	..
Puerto Rico	..	..	..
Total	8	16	48

Nuclear Medicine Society Meeting.—The Society of Nuclear Medicine will hold its fifth annual meeting in Los Angeles June 19-21, according to Dr. Marshall H. Brucer, chairman, Medical Division, Oak Ridge Institute of Nuclear Studies and president of the society. Subjects of the papers deal with diagnostic, therapeutic, and fundamental research implications or applications. Chairman of the program committee is Granvil C. Kyker, Ph.D., chief of laboratory research at the ORINS Medical Division The formal sessions will also include four instructional courses that will be offered on two days and will deal with thyroid-uptake calibration, measurement of mixtures of radioisotopes, measurement of total exchangeable electrolyte, and medical application of a five-watt aerojet reactor. The meeting will include tours of Los Angeles nuclear medical facilities, a session on the training of physicians in the use of radioisotopes, and scientific and commercial exhibits. A series of 37 small midget exhibits designed to supply a physician with the preclinical information he needs before using radioisotopes is planned. Information is available from the secretary of the society, Dr. Robert W. Lackey, 452 Metropolitan Building, Denver.

Meeting of Chest Physicians in San Francisco.—The 24th annual meeting of the American College of Chest Physicians will be held June 18-22 at the Fairmont Hotel, San Francisco. Seminars on pulmonary disease (medical) and cardiology (surgical) are planned for June 8, with question-and-answer periods following each lecture. The third Louis Mark Memorial Lecture, "The Individual Man and Medicine," will be given by Dr. John B. deC. M. Saunders, dean, University of California School of Medicine, San Francisco. A clinical cardiac conference moderated by Dr. John J. Sampson, 28 "fireside conferences," and the following forums are scheduled: Basic Research in Diseases of the Chest: (1) Pulmonary, (2) Cardiac, and Pulmonary and Cardiovascular Effects of Smoking. Symposiums on tuberculosis, clinical cardiology, idiopathic interstitial fibrosis of the lung, biologic effects of radioactive exposure on the lungs, effects of air pollution on the lungs, and congenital heart disease are arranged. Round-table luncheons will be held June 20-22. A program of ladies' activities is planned, and the annual president's banquet will be held June 21, 7:30 p. m. For information write the American College of Chest Physicians, 112 E Chestnut St., Chicago 11.

Meeting of Association for the Deaf.—The 23rd summer meeting of the Alexander Graham Bell Association for the Deaf will be held June 22-27 in Pittsburgh. Speakers at the five-day program will include S. Richard Silverman, Ph.D., director, Central Institute for the Deaf; Mr. Louis M. DiCarlo executive director, Gordon D. Hoople Hearing & Speech Center, Syracuse University; Freeman McConnell, Ph.D., director, Bill Wilkerson Hearing & Speech Center, Vanderbilt University; and Mr Robert Frisina, director, Hearing and Speech Center, Gallaudet College. The Rev. Fr. Bernard

DEATHS

mick, Louis Burton ⊕ Sac City, Iowa; Chicago ollege of Medicine and Surgery, 1908; veteran of Vorld War I; served as health officer; on the staff f the Loring Hospital; died Feb. 22, aged 77, of ardiovascular accident.

alkema, Walter S. ⊕ Sheldon, Iowa; State Uni- ersity of Iowa College of Medicine, Iowa City, 932; for many years secretary-treasurer of the 'Brien County Medical Society; on the staff of e Community Memorial Hospital, where he died eb. 4, aged 69, of adenocarcinoma.

ame, Samuel Rolland ⊕ Carey, Ohio; Eclectic edical College, Cincinnati, 1911; veteran of orld War I; died March 17, aged 73, of coronary rombosis.

lair, James Albert ⊕ Home, Pa.; Jefferson Medical ollege of Philadelphia, 1923; on the courtesy staff the Western Pennsylvania Hospital in Pitts- urgh; died March 17, aged 65, of coronary occlu- on.

lair, William McBroom ⊕ Wharton, Texas; Baylor niversity College of Medicine, Dallas, 1931; mem- r of the American Trudeau Society; fellow of the merican College of Surgeons; past-president of e Wharton County Tuberculosis Association; at e time on the faculty of his alma mater; on the aff of the Caney Valley Hospital, where he died arch 14, aged 55, of acute coronary occlusion.

oylston, Bedford Forrest ⊕ Houston, Texas; born Aiken, S. C., Sept. 25, 1916; Jefferson Medical ollege of Philadelphia, 1941; on the faculty of the ylor University College of Medicine; at one time structor of surgery at the Columbia University ollege of Physicians and Surgeons in New York ity; specialist certified by the American Board of rthopedic Surgery; president of the Houston rthopedic Club; member of the American Acad- ny of Orthopaedic Surgeons; fellow of the Ameri- n College of Surgeons; veteran of World War II; the staffs of the Jefferson Davis, Methodist, and eterans Administration hospitals; died in the D. Anderson Hospital March 22, aged 41, of ncer.

ey, Peter Francis ⊕ Milwaukee; Milwaukee Medi- l College, 1910; died in the Milwaukee County ospital in Wauwatosa, Wis., March 22, aged 79, pulmonary embolism and bronchopneumonia.

Brown, Brian Tuck, Sherman, Texas; University of Texas School of Medicine, Galveston, 1918; veteran of World War II; died March 14, aged 64.

Brown, Francis Henry ⊕ Des Moines, Wash.; University of Southern California School of Medicine, Los Angeles, 1904; formerly practiced in Seattle and was past-president of the Seattle Academy of Surgery; died March 23, aged 82, of cerebral thrombosis.

Brown, Susan Willard, Cincinnati; Rush Medical College, Chicago, 1922; formerly a medical missionary in China; died March 20, aged 66, of heart disease.

Brown, William Edward ⊕ Charlottesville, Va.; Baltimore Medical College, 1908; formerly on the faculty at the University of Virginia Department of Medicine; veteran of World War I; in June, 1944, retired as superintendent and medical director of the Blue Ridge Sanatorium; died in the University of Virginia Hospital March 17, aged 73, of cardiac insufficiency.

Bucher, Louis F., Dayton, Ohio; Rush Medical College, Chicago, 1900; for many years school physician; died in the Miami Valley Hospital March 9, aged 80.

Caldwell, Gene Delmar ⊕ Shreveport, La.; University of Nebraska College of Medicine, Omaha, 1930; specialist certified by the American Board of Orthopaedic Surgery; member of the Clinical Orthopaedic Society and American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons and the International College of Surgeons; chief surgeon for the Shriners Hospital for Crippled Childern; chief consultant for the Veterans Administration Hospital; veteran of World War II; died March 11, aged 51, of coronary occlusion.

Campbell, Marvin Bishop, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1906; veteran of World War I; died March 14, aged 78, of pneumonia.

Caraway, Agnes Burt ⊕ Shreveport, La.; Louisiana State University School of Medicine, New Orleans, 1950; formerly member of the Mississippi State Board of Health; died March 12, aged 37, of coronary occlusion.

⊕ Indicates Member of the American Medical Association.

Carlsen, Edwin Lawrence ⊕ Tacoma, Wash.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; served on the staff of the Northern Pacific Hospital, where he died March 1, aged 78, of hypernephroma of the right kidney.

Carroll, Francis Matthew ⊕ Seattle; Cooper Medical College, San Francisco, 1896; fellow of the American College of Surgeons; veteran of World War I; served as city health officer, coroner, and health commissioner; died March 10, aged 88, of chronic myocarditis, emphysema, and bronchiectasis.

Chadwick, Glenn William ⊕ Portland, Ore.; College of Medical Evangelists, Loma Linda and Los Angeles, 1951; member of the California Medical Association; died in the Portland Sanitarium and Hospital March 12, aged 33, of massive gastric hemorrhage due to ulcers.

Chaffin, Rafe Chester ⊕ Los Angeles; University of Southern California College of Medicine, Los Angeles, 1907; emeritus professor of gynecology at the College of Medical Evangelists; vice-regent and fellow of the International College of Surgeons; fellow of the American College of Surgeons; member of the senior staff of California Hospital, where he died March 23, aged 75, of acute myocardial infarction.

Claflin, Guy Malverton, Adrian, Mich.; Detroit College of Medicine, 1904; veteran of the Spanish-American War and World War I; served as city health officer; died March 20, aged 84, of circulatory failure.

Coughlin, John Benedict ⊕ Durham, N. C.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1943; member of the American Society of Anesthesiologists and the Medical Society of the State of Pennsylvania; veteran of World War II; died in the Watts Hospital March 3, aged 40.

Craig, Paul Stuart, Washington, C. H., Ohio; University of Cincinnati College of Medicine, 1929; died in the Mount Carmel Hospital, Columbus, Feb. 21, aged 60, of cerebral hemorrhage.

Cronin, John William ⊕ Assistant Surgeon General, U. S. Public Health Service, Washington, D. C.; born in Springfield, Ohio, June 15, 1905; University of Cincinnati College of Medicine, 1933; chief of medical services, U. S. Public Health Service, a post to which he was promoted in 1956, and prior to which he was chief of the division of hospital and medical facilities; from 1947 to 1949 chief, Federal Employees Health Division; executive medical officer of the U. S. Coast Guard Training Station, Sheepshead Bay, N. Y., 1943-1944; medical officer in charge of the U. S. Public Health Service Dispensary in Washington from 1944 to 1947; served as chief surgeon and officer in charge of U. S. Penitentiary Hospital in Leavenworth and Fort Leavenworth, Kan., and Federal Reformatory at El Reno, Okla.; at one time instructor of neurology at the University of Colorado in Denver, lecturer in the school of public health nursing, Catholic University, and lecturer at Georgetown University; fellow of the American Public Health Association, American College of Surgeons, and the American Psychiatric Association; service member of the American Medical Association; member of the Association of Military Surgeons of the United States, American Hospital Association, and the Industrial Medical Association; specialist certified by the American Board of Preventive Medicine; received the honorary degree of doctor of science from Miami University, Oxford, Ohio, June 6, 1955; died March 26, aged 52, following heart attack.

Crawley, Walter Garlington Jr. ⊕ Marietta, Ga. Emory University School of Medicine, Atlanta 1927; twice president of the Cobb County Medical Society and vice-president of the Georgia Pediatrics Society; formerly practiced in Lancaster S. C., and served as director of the Chester County Health Department; died in the Piedmont Hospital Atlanta, March 22, aged 55, of cancer.

Curry, Ernest Francis ⊕ Sagamore, Mass.; Tufts College Medical School, Boston, 1905; medical examiner of Barnstable County; for many years school physician for Sagamore and Bournedale, served as health officer; on the staff of the Cape Cod Hospital in Hyannis; died in the McLean Hospital, Waverly, March 17, aged 81, of cardiovascular and respiratory failure.

Dempsey, Joseph Harry, Cleveland; Western Reserve University Medical Department, Cleveland, 1912; on the staffs of the Booth Memorial Hospital in Cleveland and the Euclid-Glenville Hospital in Euclid, Ohio, where he died March 6, aged 71, of multiple pulmonary infarcts.

Downey, Carl Harris, Salem, Ore.; Willamette University Medical Department, Salem, 1912; died March 5, aged 77.

Duran-Reynals, Francisco, New Haven, Conn.; born in Barcelona, Spain, Dec. 5, 1899; Universid de Barcelona Facultad de Medicina, Spain, 19 associated with Rockefeller Institute, New York City, for 10 years, first with the rank of assist and then with the rank of associate; joined t faculty of the Yale University School of Medici in 1938 as a research assistant, was promoted research associate in 1941, and was named lectur and research associate in microbiology in 1952.

research on the influence of aging on biological processes; lectured at universities, and medical conferences throughout the United States and in Europe and Canada; died in the Grace New Haven Hospital March 27, aged 58, of cancer.

Dutrow, Howard Victor ⊕ Dayton, Ohio; born in Charlesville, Md., Dec. 30, 1880; University of Maryland School of Medicine, Baltimore, 1904; specialist certified by the American Board of Otoaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; past-president of he Montgomery County Medical Society and the Dayton Academy of Medicine; veteran of World War II; for many years member of the medical epartment of the Isthmian Canal Commission, dvancing to chief of eye, ear, nose and throat linic, Colon Hospital, Canal Zone; associated with Miami Valley Hospital, where he was formerly hief of staff, St. Elizabeth and Good Samaritan ospitals; died March 17, aged 77.

eyer, Alfred B. ⊕ Medical Director, U. S. Public ealth Service, retired, Palos Verdes Estates, Calif.; niversity of Oregon Medical School, Portland, 30; service member of the American Medical ssociation; retired from the U. S. Public Health rvice Aug. 1, 1955; member of Admiral Byrd's pedition to the South Pole and was awarded e Third Antarctic Service Expedition Medal for services as surgeon aboard the expedition ship rth Star; died in Carmel March 6, aged 55, of ronary occlusion.

lkison, William L. ⊕ Loogootee, Ind.; Indiana edical College, School of Medicine of Purdue iversity, Indianapolis, 1906; on the staff of the iviess County Hospital in Washington; died Feb. aged 84, of coronary thrombosis.

sman, George Henry Rankin ⊕ Colonel, U. S. ny, retired, Arcadia, Calif.; University of Pennvania Department of Medicine, Philadelphia, 8; member of the Massachusetts Medical Soty; fellow of the American College of Surgeons; eran of World War I; entered the medical corps the U. S. Army in 1901; retired Dec. 31, 1922; d the Distinguished Service Medal and other orations; died in the Veterans Administration spital, Los Angeles, Feb. 3, aged 81, of arteriorosis.

ham, Charles L., Tollesboro, Ky.; Kentucky ool of Medicine, Louisville, 1906; served on staff of the Hayswood Hospital, Maysville; d March 6, aged 83.

ybowski, Stanley Theodore, Chicago; Chicago dical School, 1942; served an internship at St. es Hospital in Chicago Heights, and a residency at the Highland Park (Ill.) Hospital and the Veterans Administration Hospital in Hines, Ill.; veteran of World War II; died March 5, aged 45, of coronary occlusion.

Gunn, William Parker ⊕ Janesville, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; member of the Illinois State Medical Society; veteran of World War I; associated with St. Bernard's and Illinois Central hospitals, Chicago; died March 20, aged 75, of coronary thrombosis.

Haas, Fredrick William, Naco, Ariz.; Southwestern Homeopathic Medical College and Hospital, Louisville, Ky., 1906; died in Warren Jan. 4, aged 79, of congestive cardiac disease.

Henderson, James Paris, Excelsior Springs, Mo.; University Medical College of Kansas City, 1903; served as second vice-president of the Missouri State Medical Association; served on the faculty of his alma mater; veteran of World War I; formerly practiced in Kansas City, Mo., where he was associated with the Kansas City General Hospital; served on the staff of the McLeary Hospital and Clinic; died March 11, aged 79, of acute cardiac dilatation.

Howell, William Wescott, Topsham, Maine; Harvard Medical School, Boston, 1900; practiced in Boston; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics and the Massachusetts Medical Society; died in Portland Feb. 14, aged 84, of aneurysm of the abdominal aorta.

Jones, Harold Wellington ⊕ Colonel, U. S. Army, retired, Orlando, Fla.; born in Cambridge, Mass., Nov. 5, 1877; Harvard Medical School, Boston, 1901; for two years resident and house physician in the Children's Hospital, Boston; practiced medicine in St. Louis, where he was associate professor of orthopedic surgery at St. Louis University School of Medicine, 1904-1905; commissioned in the Medical Corps of the U. S. Army in 1906; an honor student at the Army Medical School, where he later served as professor and as secretary of the faculty, 1917-1918; was in command of an ambulance train with Pershing in Mexico in 1916 and of the Beau Désert Hospital Center, near Bordeaux, France in World War I, and later of Tripler General Hospital in Honolulu; was chief of the surgical service at the Fort Sam Houston Hospital; was librarian at the Army Medical Library (now National Library of Medicine) in Washington, D. C., from 1936 until 1943 and director from 1944 to 1946; service member of the American Medical Association; an honorary member of the Cleveland

Medical Library Association; formerly secretary-treasurer of Association of Honorary Consultants to the Army Medical Library; was honorary curator, Osler Library, Montreal, from 1936 to 1946, president, Medical Library Association, 1940-41, editor of the *Bulletin of the Medical Library Association*, 1941-1942; awarded the honorary LL.D. degree by Western Reserve University in 1945; in 1956 received the Marcia C. Noyes Award; was chief delegate to the 9th International Congress of Military Medicine in Bucharest in 1937, and secretary-general of the 10th International Congress in 1939 in Washington and editor of its proceedings; vice-president of the International Congress of Air Relief in Bucharest in 1937; delegate in 1937 to the Geneva Convention of the International Hague and Geneva–Red Cross Societies; decorated by France (twice), Rumania, Poland, Mexico, and the United States (Legion of Merit in 1945); fellow of the American College of Surgeons and the American Association for the Advancement of Science; honorary member of the Mexican Association of Military Surgeons; edited the "New Gould Medical Dictionary"; for several years chief editor of the medical section of the "Encyclopedia Americana"; died suddenly April 5, aged 80.

Jones, Isaac Newton, Greensboro, Ala., Birmingham Medical College, 1909; member of the Medical Association of the State of Alabama; served as county health officer; died Feb. 26, aged 74.

Koenig, Charles Albert ⊕ Woodville, Pa.; St. Louis University School of Medicine, 1911; served as assistant professor of psychiatry at the University of Pittsburgh School of Medicine; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; veteran of World War I; for many years clinical director of the Woodville State Hospital; died in St. Mary's Hospital, Riviera Beach, Fla., Feb. 26, aged 73, of pneumonia and diabetes mellitus.

Levison, Louis A. ⊕ Toledo, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; associated with Toledo Hospital and St. Vincent's Hospital, where he died March 10, aged 77, of virus pneumonia and hypertensive heart disease.

Lewis, Walter Warren, Marvell, Ark.; University of Tennessee College of Medicine, Memphis, 1914; died in Helena (Ark.) Hospital Jan. 4, aged 69.

Magee, David Miller Pomfret, Marianna, Fla.; Un versity of Pennsylvania Department of Medicin Philadelphia, 1906; died March 4, aged 73, of pu monary edema, bronchopneumonia, and congesti heart failure.

Magill, William Henry ⊕ Providence, R. I.; Corn University Medical College, New York City, 190 fellow of the American College of Surgeons; serv on the medical draft board during World War formerly chief medical examiner in Rhode Isla and for many years Providence medical examine associated with Rhode Island and St. Joseph's ho pitals; died March 12, aged 87.

Main, Robert E., Vernon, Texas; St. Louis Colle of Physicians and Surgeons, 1898; died Feb. aged 88.

Margulis, Abraham Bernard ⊕ Bridgeport, Con Medical School of Maine, Portland, 1920; died Miami Beach, Fla., March 8, aged 67, of corona thrombosis.

Mavraides, William Peter ⊕ Boston; University Vermont College of Medicine, Burlington, 19 certified by the National Board of Medical Exa iners; died March 7, aged 54.

McCann, Neal Joseph ⊕ Torrance, Calif.; Loyo University School of Medicine, Chicago, 19 served as president of the Marquette–Alger Cou ties (Mich.) Medical Society; veteran of Wor War I; formerly health officer of Ishpeming, Mic died March 10, aged 58, of arteriosclerotic hea disease.

Mixter, William Jason ⊕ Woods Hole, Mass.; bo in 1880; Harvard Medical School, Boston, 190 member of the founders group of the America Board of Surgery; specialist certified by the Ame ican Board of Neurological Surgery; member of th American Surgical Association, International So ciety of Surgery, American Neurological Associa tion, and the Association for Research in Nervou and Mental Disease; fellow of the American Colleg of Surgeons; past-president of the New Englan Surgical Society; veteran of World War I; senio civilian consultant for neurosurgery to the Surgeo General during World War II; honorary surgeon a the Massachusetts General Hospital, where he wa chief of neurosurgical service; died March 16, age 77, of carcinoma of the lung.

Moffett, William Thomas, Blue Mound, Ill.; Rus Medical College, Chicago, 1895; veteran of Worl War I; died in Wauchula, Fla., Feb. 20, aged 9 of acute cardiac failure.

Mugrage, Edward Rosseter ⊕ Denver; born in Leadville, Colo., in 1885; University of Colorado School of Medicine, Denver, 1913; professor emeritus of clinical pathology at his alma mater; specialist certified by the American Board of Pathology; member of the College of American Pathologists and the American Society of Clinical Pathologists; fellow of the American College of Physicians; past-president of the Colorado State Medical Society; for many years secretary-treasurer of the Medical Alumni Association of the University of Colorado School of Medicine; associated with Swedish National Sanatorium in Englewood, St. Luke's Hospital, National Jewish Hospital, Children's, Denver General, Mercy, and St. Joseph's hospitals; died in the Colorado General Hospital March 4, aged 72, of acute enterocolitis.

Tallman, Ralph LaRue ⊕ Chicago; Loyola University School of Medicine, Chicago, 1928; a member of the board of governors of South Shore Hospital; died March 20, aged 59.

Taylor, Cornelius John ⊕ Bangor, Maine; Medical School of Maine, Portland, 1911; served as medical examiner for Penobscot County; for many years medical examiner for the Metropolitan Life Insurance Company and the New York Life Insurance Company; on the staff of the Eastern Maine General Hospital; died Feb. 18, aged 70, of acute coronary disease.

Taylor, John Mortimer, South Egremont, Mass.; Columbia University College of Physicians and Surgeons, New York City, 1898; died in the Fairview Hospital in Great Barrington March 6, aged 86, of bronchopneumonia.

Taylor, Martin Clever, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; an associate member of the American Medical Association; member of the American Academy of Ophthalmology and Otolaryngology; associated with the Southside Hospital; died Feb. 23, aged 80, of pulmonary embolism.

Taylor, Ralph Buren ⊕ Columbus, Ohio; Eclectic Medical Institute, Cincinnati, 1898; served as a member of the Ohio State Medical Board; associated with the Grant Hospital, and the Home for Aged; died Feb. 23, aged 84, of arteriosclerosis.

Taylor, Walter Frederick, Keene, N. H.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1914; member of the New Hampshire Medical Society; served as a member of the board of health, and as city and school physician; veteran of World War I; died Feb. 21, aged 70.

Thayer, James Manning ⊕ Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1954; service member of the American Medical Association; a captain and flight surgeon in the U. S. Air Force; killed Feb. 15, aged 27, in the crash of a transport plane on Mount Vesuvius, outside Naples, Italy.

Thomas, Francis Willard, Columbus, Ohio; Starling–Ohio Medical College, Columbus, 1912; served on the faculty of the Ohio State University College of Medicine; specialist certified by the American Board of Otolaryngology; associated with Grant and Mount Carmel hospitals; died in Palm Beach, Fla., Feb. 18, aged 68, of coronary disease.

Tuttle, George Bass, Arlington, Va.; Washington University School of Medicine, St. Louis, 1894; formerly served in the regular Army; died in the Arlington Hospital Feb. 19, aged 86.

Twente, Julius ⊕ Thomasville, Ga.; Rush Medical College, Chicago, 1930; service member of the American Medical Association; medical officer at Veterans Administration Domiciliary; died in the Archbold Memorial Hospital Feb. 4, aged 58.

Walker, William A. ⊕ Cairo, Ga.; Louisville (Ky.) Medical College, 1889; served as mayor of Cairo, as a member of the county board of education, and in the Georgia Legislature; died Feb. 20, aged 91.

Webster, Fred Paterson ⊕ Portland, Maine; Harvard Medical School, Boston, 1901; member of the American Academy of Pediatrics; at one time professor of pediatrics at the Bowdoin Medical School; on the staffs of the Maine Eye and Ear Infirmary and the Maine General Hospital; died Feb. 26, aged 79, of coronary thrombosis.

Weiss, Rudolf ⊕ Cleveland; Medizinische Fakultat der Universitat, Vienna, Austria, 1917; associated with Mount Sinai Hospital; died March 2, aged 66, of myocardial infarction.

Wescott, Clement Plummer ⊕ Portland, Maine; Tufts College Medical School, Boston, 1909; served on the staffs of the Mercy and Maine General hospitals; died Feb. 16, aged 79, of heart disease.

Wilson, James Frederick, Washington C. H., Ohio; College of Physicians and Surgeons, Baltimore, 1909; served as secretary of the Fayette County Medical Society; for many years county health commissioner; past-president of the Ohio Federation of Public Health Officials; died in the Mount Carmel Hospital, Columbus, March 4, aged 76, of cerebrovascular thrombosis.

FOREIGN LETTERS

AUSTRIA

Phimosis.—At the meeting of the Society of Pediatrics in Vienna in March Dr. H. R. Jonas emphasized the necessity of differentiating between true phimosis characterized by an abnormal narrowing of the preputial ring and pseudophimosis with an elongation of the prepuce and physiological adhesion of the prepuce to the glans penis. The separation of the preputial adhesions or the stretching of the prepuce in early infancy is in general not advisable. As a rule, the adhesions spontaneously separate in the second or third year of life. The stretching of a contracted and elongated prepuce should be performed with great care but not earlier than between the second and third year. Surgical treatment of a genuine phimosis can be performed as late as the third year of life unless recurrent balanoposthitis or paraphimosis make an early operation necessary. Circumcision with extensive resection of the inner preputial membrane is the operation of choice.

Dr. H. K. Kundratitz stated that surgical treatment of a phimosis is rarely necessary. In most cases stretching the prepuce will correct the condition. He saw no objection to a separation of the adhesions during infancy, since failure to do so might result in balanitis and retention of smegma. Dr. H. W. Lesigang said that the phimosis in nurslings is physiological. Congenital phimosis with a retention of urine rarely occurs, but when present it should be corrected. As long as the flow of urine is free, the condition is harmless. Attempts at stretching of the prepuce by the mother as prescribed by some practitioners is to be condemned for psychological reasons and because of sexual irritation. Inflammations of the prepuce in children from the second to the sixth year of life are mostly caused by friction of the clothes. The friction may cause an inflammatory swelling, especially of a prepuce that has been hypertrophic from birth. In this stage the retraction of the prepuce over the glans is difficult. The usual treatment of such an inflammation will restore normal conditions within a few days.

Symposium on Carcinoma of the Uterine Cervix.—At the meeting of the Society of Physicians in Vienna on March 14 Dr. Antoine said that better results in the campaign against carcinoma of the uterine cervix are due to earlier diagnosis and new therapeutic developments. Three methods for early diagnosis are cytology, colposcopy, and colpomicroscopy. R. Klein and H. Kremer said that malignant epithelial cells are relatively easy to detect in a smear. The findings were accurate in 93.7% of the patients with carcinoma of the uterine cervix and nonevasive carcinoma in their series. Dr. V. Gruenberger said that in 1956 and 1957 of 150 patients with carcinoma of the uterine cervix who were examined by the three methods mentioned, 35 (23.3%) were not suspected of having carcinoma on macroscopic examination. If the doubtful cases are added to those with positive findings of carcinoma, all three methods showed about the same efficacy. Three of these cases were detected by the colpomicroscope alone, and four by cytology alone. In only one case did all three methods fail—an accidental histological detection of subepithelial spread of carcinoma in a patient whose cervix was amputated immediately above the vagina. Of 547 othe patients with histologically detected erosions, false positive findings were obtained in 17 to 20% and correct diagnosis was made only by biopsy.

Dr. Antoine said that when the results wer doubtful the patient should be kept under clos observation. A positive result requires biopsy t corroborate the diagnosis. Conization or amputation of the part of the uterine cervix immediatel above the vagina combined with a curettage proved to be the most efficacious treatment. Dr. A. H. Dalmrich stated that treatment of the preinvasive carcinoma consisted of high amputation of the cervix or high conization. An extirpation of the uterus would have to follow if all the invaded area was not removed. The Schanta-Wertheim operation can be applied to patients with invasive carcinoma. If operation is still desirable in a patient with advanced carcinoma which has spread to the bladder or rectum, posterior, anterior, or total evisceration must be performed. Drs. E. Picha and K. Weghaupt said that only carcinomas classified in groups 3 and 4 should be irradiated. The standard method includes three insertions which are performed at intervals of two weeks. The first two insertions are vaginal whereby about 80 mg. of radium, radiocobalt, or radiogold is affixed to the front of the cervix. The third insertion (also 80 mg.) is intrauterine. This standard method must be adapted to the individual patient.

Dr. K. Fochem reported that after a radical operation he gives a total of 16,000 r of x-rays in three series. The noninvasive carcinoma (stage 0) is not irradiated postoperatively. If an especially large area has been invaded, up to 12,000 r should be

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The items in these letters are contributed by regular correspondents in the various foreign countries.

applied to lateral fields and 2,000 to 3,000 r to a vulvoperineal field. For recurrent cases the body cavity tube, cross fire irradiation, moving irradiation, or grid irradiation may be used. The last-mentioned method proved most valuable because a maximum dosage was least damaging to the skin. In 17 of 30 women with recurrent carcinoma of the uterine cervix who were irradiated, the recurrent tumor disappeared; in 7 the tumor receded slowly, and the rest were therapeutic failures. Dr. J. Spurny said that the absolute five-year cure rate in 312 patients admitted and treated in all stages of the disease amounted to 55.8% with 51% of the patients in an operable condition.

Lupus Erythematosus.—At the meeting of the Society of Physicians in Vienna on March 28, Drs. F. Egghard and H. Braunsteiner reported on five patients with visceral lupus erythematosus. The prodromal phase may last for years; in one patient it lasted eight years. This phase is characterized by few symptoms in most patients, and joint complaints and pleuritis occur most frequently. Joint involvement plays an essential part in the progress of the disease. No major joint deformities occurred in the above-mentioned patients despite a prolonged course. Lupus erythematosus must be differentiated from primary chronic polyarthritis. The characteristic cutaneous changes did not occur in four of the five patients. The diagnosis was based on the L. E. cell test. Four patients became almost completely free of complaints as a result of maintenance therapy with prednisolone. One patient died of renal and pulmonary complications.

Treatment of Edema with Chlorothiazide.—At the same meeting Drs. H. Frischauf and G. Geyer reported on the effect of chlorothiazide, a diuretic related to acetazolamide. Part of the diuretic effect is attributed to suppression of carboanhydrase which may be recognized by the increased elimination of carbon dioxide and the reduction of the titratable acidity in short-term experiments. The increase of sodium excretion occurring after the administration of the diuretic is, however, accompanied by a distinct increase of chloride excretion in contrast to the effect produced by acetazolamide. Chlorothiazide remains effective even if given over a long period.

BRAZIL

Prolapse of Rectum in Childhood.—Prolapse of the rectum in children may be due to conditions which are different from those in adults, such as heavy infestation with intestinal parasites and the position taken during defecation, according to Drs. A. Amorim and A. F. de Camargo (*Maternidade e Infância*, March, 1958). They advocate supporting the natural healing tendencies rather than surgical interference. If operation becomes necessary trauma must be kept to a minimum. In their series of 63 patients 61 made complete recoveries, and 2 left treatment against medical advice.

FRANCE

Mass Production Laboratory.—At the Rothschild Foundation's Laboratory, Suchet has devised a means whereby all the hematological and serologic reactions required can be obtained from a single specimen of blood. One of his centrifuges holds 200 test tubes. He can make 20 different tests with only 1 cc. of blood from the finger. Tests for anemia can be made on 200 people in 10 minutes, and one laboratory technician can perform 1,400 tests a day.

Angina Pectoris.—At a meeting of the French Society of Cardiology M. Blondeau and co-workers reported on the studies of electrocardiographic changes (apart from effort) in 200 patients with angina pectoris of effort, excluding all spontaneous or prolonged attacks and other valvular or hypertensive cardiopathy. The age at which angina pectoris started was between 37 and 71 years. The elapsed time between the onset of angina and the electrocardiographic study was 5 days to 15 years. the tracings showed (1) major anomalies in 56 (bundle-branch block in 13, myocardial infarction in 15, ischemia in 26, and left ventricular hypertrophy in 2); (2) minor anomalies in 82 (flattening of the T wave in 23, flattening of the T wave with dome-shaped ST segment in 9, symmetrical and pointed T waves in 17, and miscellaneous anomalies in 33); and no anomalies in 62. Age and sex did not influence the electrocardiographic patterns but the duration of the disease was an important factor. The maximal electrical deviations were seen in patients with an onset of less than three months. Tracings made after exertion in 38 patients modified the pattern of 13. This was observed more frequently in those with abnormal tracings at rest.

Palfium.—Although the World Health Organization has placed Palfium (2,2-diphenyl-3-methyl-4-morpholino-butyl-pyrrolidine) in the group of poisonous drugs of the same character as morphine, Professor Langeron (*Journal science medicales de Lille*, vol. 76, 1958) vigorously maintains that this drug is not habit-forming. He believes that it is a potent and a true analgesic, suppressing pain rather than masking it. It has no toxic effect on the heart, liver, or kidneys. It provokes minor secondary but frequent reactions (mostly dizziness), but these disappear in time and are rare when the drug is given for severe pain. The dose should be adapted to the individual patient. The drug should be given only under medical supervision.

Cerebral Atrophy in Infantile Chronic Encephalopathy.—Sarrouy and co-workers (*La semaine des hôpitaux de Paris* 34:845, 1958) studied patients with infantile chronic encephalopathy using aeroencephalography to localize areas of cerebral atrophy. False positive diagnoses are often made because of inequality in the thickness of the subarachnoidal space, especially at the level of the frontal lobe; injection of air into the subdural space; and modifications in water metabolism of the cerebral parenchyma. With these reservations in mind it is possible to observe certain changes in the pneumoencephalogram in patients with cerebral atrophy. In the presence of motor disturbances the ventricular dilatation is observed either alone or associated with the cortical sulci, in the shape of irregularities. This is evidence of a subcortical atrophy, most often symmetrical in the case of diplegia and paraplegia and nearly always asymmetrical in the case of hemiplegia. In those patients in whom the psychic or psychomotor disorders prevail there is often a diffuse dilatation of the sulci of the convexity indicating a diffuse cortical atrophy. The pneumoencephalogram is, however, frequently normal. The presence of an obvious cerebellar syndrome associated with the course of an encephalopathy is a radiologically detectable cerebellar atrophy in 90%. In patients with severe encephalopathy, theatrophic changes are usually diffuse, cortical, and subcortical.

Carcinoidosis.—In a symposium on carcinoidosis in *La semaine des hôpitaux de Paris* (34:647-673 [March 4] 1958) Geffroy and Jouanneau stated that the vascular storm characteristic of this disease is probably caused by the discharge of serotonin. Beside the cutaneomucosal, abdominal, and respiratory signs, they observed electroencephalographic manifestations. R. Laumonier and co-workers stressed the absence of lesions in the right side of the heart and the presence of renal changes and cerebral edema in patients with this disease. The histochemical findings showed that silver reduction and argentaffin tests are common to the various types of carcinoid, whether functional or not, whereas yellow fluorescence and the diazo reaction express the functional aptitude of the tumor to elaborating serotonin. Schrub and Geffroy said that the slow development of intestinal carcinoids is no contraindication to the surgical removal of the primary tumor and accessible metastases even though the metastases were widely disseminated. In the presence of carcinoidosis, the use of antagonists to serotonin with a view to preventing the paroxysmal accidents has failed and may even aggravate this disease. Treatment with radioactive colloidal gold was followed by dramatic, but transient, remission.

Community and Health Insurance.—The medical delegates of the national organizations representing cosignatory countries of the European Economic Treaty approved the spirit which presided at the drawing-up of the treaty (*Med. et hyg.* 15:152, 1958). This treaty looked towards establishing harmony between the medicosocial systems and in particular of the various social insurance systems. The physicians representing Western Germany, Belgium, France, Italy, Luxembourg, and Holland, meeting at Luxembourg in January and February, said that the reforms and adjustments of the medicosocial systems should maintain the liberal character of the medical profession but should also conform to the conditions and to the economic and social possibilities of the cosignatory countries. The delegates agreed that (1) the medical profession should keep its liberal character; (2) the patient should have free choice of his physician; (3) the physician should be free to prescribe whatever he believes will benefit his patient; (4) professional secrecy should not be violated; (5) fees should be based on the service given and not on the financial status of the insurance company; (6) the physicians should be represented in all medicosocial organizations; and (7) medical control should be independent of the administrative authorities.

Medical Psychology and Hospitals.—Mr. G. Berger, general director of higher education, at the first conference on medical psychology in March at Rennes announced the creation of an institution of human science (*Med. et hyg.* 15:152, 1958). He said that because the patient's morale is an important factor contributing towards recovery, medical students should be taught the essential elements of psychology. All the speakers stressed the therapeutic value of a comprehensive medical interview, apart from any prescription. Understanding the patient's mental reactions and acting on them has been practiced since Hippocrates. The increasing use of the exact sciences in modern medicine involves the risk of overshadowing the art of medicine, thereby jeopardizing therapeutic results.

Professor Lamache and Dr. Davost deplored the depersonalization of the treatment given in many modern hospitals. This is aggravated by the fact that the patient is deprived of his own clothing and most of his personal belongings and that the visiting hours are often inconvenient for his family. It has been shown that a child separated from his mother has a much longer convalescence than one kept with his parents. Lamache and Davost concluded that visiting of patients in hospital by their families should be encouraged and the psychological and social training of medical students and nurses should be increased. Psychological examination is just as important as roentgenological examination or blood analysis. The physician should explore the structure of the family environment and the professional and social life of the patient.

ICELAND

Eradication of Echinococcosis.—Dr. N. Dungal (*Nord. med.*, March 27, 1958) stated that in 1890 a law was passed putting a tax of 2 kroner on every dog in the country. Dogs were not to be fed on the entrails of cattle and sheep, and once a year every dog had to be treated with some vermifuge, each county being obliged to provide a building in which all its dogs could be collected for this purpose on a given day. No dog was allowed inside an abattoir, and slaughtering outside an abattoir was forbidden. Hitherto, however, rams were castrated as lambs and were not slaughtered till they were 3 or 4 years old. While at pasture they had thus had ample time in which to become infested. This system has now been abandoned in favor of slaughtering lambs when they are 4 or 5 months old so that the parasite does not have a chance to come to maturity. This change of policy has done more than any other measure to stamp out echinococcosis. Other contributory factors include greatly increased general cleanliness, with improved human habitations to which dogs are not admitted. At the close of the last century, about 25% of the adult population harbored echinococci. In 1956 they were found at 6 of the 279 autopsies performed, and as these cases presumably represented infections dating back a long time, Iceland may now be said to have successfully eradicated the disease.

INDIA

Barium Enema in Intestinal Amebiasis.—Basu and Bhattacharya (*Bulletin Calcutta School of Tropical Medicine*, vol. 5, 1957) studied 84 patients with intestinal amebiasis and diagnosed parasitologically by means of a barium enema. Eight of these were asymptomatic cyst passers, 31 had vague abdominal symptoms, 15 had recurrent diarrhea, and 30 had acute or chronic dysentery; 61 showed suggestive radiological signs after barium enema examination. These included (1) cecal lesions in 27—the cecum did not fill or filled incompletely and this was associated with tenderness and restricted mobility; (2) irregular contour of the colon—this was the most frequent finding, being present in 43; the colon had a moth-eaten appearance or was grossly irregular with a fuzzy outline while fine spicules of the contrast medium projected beyond the colonic outline; the terminal ileum was also irregular in 3 patients; (3) lack of haustration was seen in 5 and irregular haustration in 3; (4) multiple filling defects suggestive of amebic granulomas were seen in 1; and (5) persistent spasm, influx of the barium into the small intestine, and incomplete emptying, as seen in the remaining patients.

These findings were compared with those obtained in 72 patients with nonspecific colitis after a barium enema. Cecal deformity was uncommon in these patients. In a few who showed deformity of the cecum, a past history of dysentery was obtained; while in another, subsequent examination of stools revealed Endameba histolytica. Irregularity of the colon was observed in both conditions. The spiky appearance was more commonly seen in amebiasis but was rarely found in nonspecific colitis. Lack of haustrations was more common in nonspecific colitis. As the radiologic signs were not observed in all patients with amebiasis, although stools examination was positive for E. histolytica, the colonic damage could not be ascertained radiologically in all. In patients in whom radiologic signs were seen, some assessment of the damage could be made. Thus cecal deformities suggested chronic lesions. Spiky appearance was probably indicative of ulceration with or without superimposed localized spasm of the muscularis mucosa. Lack of haustration and irregular haustration suggested chronic inflammation of the colon. Postevacuation studies of 22 patients in whom emptying was complete showed evidence of chronic colitis such as a disorganized pattern of the mucosa, thickened plicas, and lack of haustrations. Barium enema examination was repeated after treatment in 12 patients. In five the abnormalities had disappeared while others showed persistent fine irregularities. The cecal deformities, whenever present, did not disappear after treatment.

Mongolism in Children.—Manchanda and Guleria (*Indian Journal of Child Health*, vol. 7, February, 1958) came across 35 children with mongolism in a series of 200 mentally retarded children; 21 were below 3 years of age, the youngest being 3 months old and the oldest 15 years. Seven mothers gave birth to normal children after the birth of the mongoloid child; 18 were above 35 years of age; the average age of the mother at the time of the birth of the mongoloid child was about 34 years. There was no history of an attempt to end the pregnancy in any case nor was there any significant illness or accident during the antenatal period. No instance of mongolism was found in other siblings or either parent and none of the 35 children were twins. There was no history of consanguinity. The incidence of some clinical features characteristic of this condition, such as flat occiput, squint, and other ocular anomalies was low in this group as compared with other reports but obliquity of the eyes and hypotonia were present in all cases. Grading of mental retardation revealed imbecility in 50% and idiocy in 30 to 35%; the rest were morons. Congenital ventricular septal defect was suspected in 3 patients; 16 gave a history of repeated respiratory infections and needed antibiotics. In one child there was evidence of a primary tuberculous complex which was confirmed at autopsy. Histological examination of the brain of this child showed marked atrophy of neurones and increase in cerebral glial tissue. Advanced maternal age was the only possible causative factor observed.

Family Planning.—Launched as an official part of the First Five-Year Plan, the family planning program is gradually gathering momentum. During the Second Plan period, it has been intensified by opening a large number of clinics, urban and rural; providing financial assistance to state governments and voluntary organizations for family planning centers; and extending the training program for different categories of personnel who will implement the program. Research into population problems has also been fostered. Greater efforts are being made to educate the public on the methods of family planning. About $10,500,000 has been allocated to this program in the Second Plan period. The fundamental consideration in this connection is that the population of India is growing at the rate of about 5 million a year and the various programs for economic development envisaged in the Five-Year Plan would be upset by a continuous increase in the population at this rate.

Amodiaquin for Lupus Erythematosus.—P. H. Magnin (*Current Medical Practice*, vol. 11, February, 1958) treated lupus erythematosus with antimalarial drugs. The first to be tried was quinacrine in a series of 23 patients who took 0.3 Gm. by mouth daily. The results were favorable in 17 and the lesions disappeared completely in 8. Because of the side-effects of the drug it was used only topically or by iontophoresis in another group of patients, but the results were not satisfactory. Combined therapy using the drug topically and orally gave better results. The next drug to be tried was chloroquine which was given to 16 patients in a daily dose of 0.5 Gm. The lesions disappeared completely in 8, partially in 6, and in 2 the response was poor. The author then gave 0.4 Gm. of amodiaquin daily to 23 patients. The lesions disappeared completely in 16 and improved in 3. There was only one relapse. Intolerance was infrequent and of little importance. Amodiaquin was thus found to be an active therapeutic agent in the treatment of this disease and in some its results were dramatic. The mechanism of its action is unknown but is probably due to its antiactinic property. Its therapeutic efficiency is equal or even greater than that of other antimalarial drugs used in the treatment of lupus erythematosus. As relapses are frequent, a prolonged follow-up period is necessary.

Treatment of Chorea with Corticotropin.—S. L. Malhotra (*Indian Journal of Child Health*, vol. 7, March, 1958) treated four patients who had chorea with corticotropin. Three had the severe type with involuntary movements that were disabling and one had a mild case. Corticotropin was given by intramuscular injection in two doses, the total daily dose being 10 to 20 units for a period of four to eight days. They were also given 0.6 Gm. of aspirin three times daily and 5 mg. of vitamin K daily by mouth. Clinical classification and progress were based on the clinical features, a dexterity test which consisted of unbuttoning a jacket, and a writing test. The improvement following the injections of corticotropin was dramatic. There was a cessation of involuntary movements and improvement in the dexterity and writing tests. The patients were followed up for periods for 8 to 24 months and the improvement had been maintained, but because of the possibility of remissions, the small number of patients treated, and the absence of suitable controls, no definite conclusion could be drawn.

Industrial Medicine.—At the ninth All India Conference of the Society for the Study of Industrial Medicine in Madras in February Dr. U. K. Rao said that medicine should consider the complex problems that link the health and welfare of the workers and their families. He suggested that industrial medicine should form part of the training of every physician. Accidents in factories are costly to industry both on the production front and on the efficiency front. Safety-first programs should therefore receive a high priority. The balance between mechanization and employment must be carefully managed in order to avoid creating fear, mistrust, and anxiety among the workers. He also suggested the establishment of institutes of occupational health to provide the requisite training to specialists in industrial medicine. Referring to the Employees' State Insurance Scheme, he said that from the point of view of the worker, it was distinctly a step forward. There have been many obstacles to the smooth working of this scheme but they are being gradually eliminated.

Venographic Studies of Chronic Filariasis.—U. S. Arora and co-workers (*Bulletin of Calcutta School of Tropical Medicine*, vol. 5, October, 1957) made venographic studies of the veins in the extremities of 15 patients with chronic filarial lymphedema. The lymphedema was unilateral in all patients so the opposite limb could be used as a control. The duration of illness varied from two to five years. The edema was solid nonpitting or slightly pitting. No microfilariae could be found in any of the affected limbs. In the leg the long and short saphenous veins were within normal limits in 11 of 12 patients, there being no dilatation stenosis or local intramural or extramural obstruction. The deep leg veins also appeared normal. In the thigh the long saphenous and femoral veins showed no abnormality. The veins in the lymphedematous upper extremities were also normal. Thus there was no indication of any anatomic or functional disturbance in venous systems of the affected limbs to account for the edema.

Hemophilia.—J. B. Chatterjee and co-workers (*Bulletin of Calcutta School of Tropical Medicine*, vol. 5, October, 1957) stated that hemophilia is a syndrome consisting of deficiency of antihemophilic globulin (AHG), plasma thromboplastin component (PTC), and plasma thromboplastin antecedent (PTA). AHG and PTC are indispensable for normal coagulation. Deficiency of AHG and PTC ordinarily occurs only in males while PTA deficiency may occur in both sexes. The authors attempted to ascertain the specific deficiency factor in 14 patients with hemophilia. In addition to platelet counts and a study of platelet morphology, they determined the bleeding and coagulation time, capillary resistance, clot retraction time, and levels of prothrombin plasma labile factor, serum prothrombin conversion accelerator, and fibrinogen. All the tests were normal except the coagulation time which was prolonged in all but two patients, the serum prothrombin activity which was high, and the prothrombin consumption which was low in all patients. Results of the corrective studies showed deficiency of AHG in nine patients, of PTC in three, and of PTA in one, a 56-year-old woman who had hematuria. One patient had a combined deficiency of AHG and PTC. The ratio of the incidence of various deficiencies approximated that reported in other countries.

Diaminodiphenyl Sulfone.—Chatterjee and Poddar (*Bulletin Calcutta School of Tropical Medicine*, vol. 5, October, 1957) studied the uptake of diaminodiphenyl sulfone by patients with leprosy to determine the localization of the drug in the affected tissues. Biopsy specimens of healthy and affected tissues were made after a single oral dose of 4 μc per kilogram of body weight of the sulfone tagged with S^{35} was given to the patients. Autoradiographs of healthy and affected tissues showed a greater concentration of radioactive drug in the affected than in the healthy tissues. The localization in the affected skin was most marked around hair follicles, sweat glands, blood vessels, nerves, and areas of lymphocytic infiltration. The histiocytes, epithelioid cells, and foam cells also showed a high concentration.

Capillary Permeability in Chronic Filariasis.—Arora and Bhaduri (*Bulletin of Calcutta School of Tropical Medicine*, vol. 5, October, 1957) stated that the protein concentration of the peripheral lymph and the accumulated tissue fluid in chronic filarial lymphedema of the extremities is much higher than normal. To determine whether this is due partly to the presence of excessive leakage from the capillaries, the authors used the cuff experiment devised by McCance and Thrussel on 10 patients with lymphedema of forearm and hand on one side. The duration of the illness was between 20 and 50 years. An increased filtration rate was seen in all but one patient. Thus an increased capillary permeability together with the pathological changes in the lymphatics would appear to cause chronic filarial lymphedema.

NEW ZEALAND

Carbon Monoxide Hemoglobin Estimation.—J. Brueckner and F. B. Desmond (*Clin. Chim. Acta* 3:173, 1958) described a simple and reliable spectrochemical method for the rapid estimation of carbon monoxide hemoglobin (HbCO). The quotient value of specific extinction coefficients of a hemoglobin pigment in solution measured at two wavelengths is a constant and characteristic figure. If two pigments are present in the same solution the quotient can be used to calculate the proportions of each pigment. The authors have further introduced the use of the ratio of extinction values at two suitable isobestic points of oxyhemoglobin (HbO_2) and HbCO to indicate the presence of other pigments or sources of interference which could adversely influence or offset the sensitive spectrophotometric measurements. In the methods hitherto described, though they are theoretically sound, little endeavor has been made to guard against such intereferences. The present method requires only 0.1 ml. of blood obtained by finger prick; 2 ml. of saponin-ammonium hydroxide diluting solution is added to the sample in a centrifuge tube. To obviate any possibility of dissociation of HbCO, mixing is done gently. The solution is then centrifuged for 10 minutes at 3,000 rpm. By strong transmitted light the fine clot which forms is easily seen and readily removed with a capillary pipette. The now clear solution is transferred to a 0.1-cm. cuvette, the extinctions (E) at 541, 561, 573, 577, and 597 mμ are measured and the ratios $E_{541}:E_{561}$, $E_{577}:E_{561}$, and $E_{573}:E_{597}$ are calculated. The percentage of HbCO can be read directly from a standard graph.

Experimental Lung Transplantation.—Realizing that the biological barrier of tissue resistance will not allow successful homotransplantation of lung, except possibly in identical twins, J. Borrie and J. Z. Montgomery (*Proc. Univ. Otago M. School* 36:1, 1958) reported that it seemed reasonable, however, to evolve a technique for completely excising and reimplanting a lung in the same animal and checking function by oxygen uptake studies before and after operation. A method for dividing and resuturing in turn the pulmonary artery, vein, and bronchus was first devised, then complete excision and reimplantation were performed at the one operation. The left lung has been removed and reimplanted in 10 sheep. Because its upper lobe bronchus arises directly from the trachea, the right lung was not used. None of the 10 sheep survived beyond six days, early deaths being due to tension pneumothorax in one, operative hemorrhage in one, and bronchial obstruction in three and late deaths being due to a slowly developing thrombosis within the pulmonary artery or veins producing pulmonary infarction. Of five animals who had immediate postoperative differential bronchospirometry, however, two had ventilatory and oxygen-absorbing function similar to their preoperative tracings and one had a latent function made obvious when the right lung was occluded. These tracings indicate the pattern of respiration one may expect when successful lung homografting becomes a reality.

Hypnosis of Prisoners.—Dr. H. M. Buchanam reported at the annual conference of Justice Department psychologists that he used hypnosis for 16 difficult prisoners and that it was a better method of helping muddled and hysterical prisoners than the use of tranquilizing drugs, although the use of tranquilizers has not been given up. One subject was a young man with hysterical paralysis of the leg. Physiotherapy gave no relief, but hypnosis helped him to walk without crutches and to make a complete recovery. Another subject, a 22-year-old girl, was aggressive and insolent and required tranquilizers in large doses. After hypnosis the dose of the drug was reduced and finally cut out. The girl was released and entered nurse's training.

Bovine Tuberculosis.—At the Annual Conference of the New Zealand Veterinary Association, Dr. C. H. King reported that bovine tuberculosis was probably responsible for 40 to 50 new cases of tuberculosis in human beings and five or six deaths each year. The disease is a rural problem, and it seldom appears in the bovine form in townspeople. A highly dangerous practice is the feeding of rural children with unpasteurized milk, as some people still wrongly believe that milk containing the living bacillus of bovine tuberculosis confers immunity against the disease to the child. The general incidence of bovine tuberculosis in cattle in New Zealand is about 11%, but in vast areas it is 2% or less. In certain localities it reaches 50%. For any national scheme of eradication to be successful, it must initially operate on a voluntary basis, and restrictive controls should therefore be kept to a minimum. It is not yet clear how best to protect a tubercle-free herd from reinfection. The greatest problem to a national scheme of eradication is the shortage of trained personnel to undertake all the testing required.

SWEDEN

Urogenital Tuberculosis.—A. Beskow (*Nord. med.*, Feb. 20, 1958) sought for urogenital tuberculosis in such of the 367 patients admitted to Romanäs Sanatorium during the period 1950 to 1952 as had disturbances of micturition and albuminuria. In the three years, 1953 to 1955, the search for urogenital tuberculosis was made routinely in practically every case. In the first three years only 79 patients were examined for urogenital tuberculosis, which was found in 5. In the second three-year period 485 patients were thus examined, and urogenital tuberculosis was found in 9. Among this total of 14 patients there were 2 in whom both the guinea pig test and the culture were positive, and 12 in whom the guinea pig test was positive and the culture negative. There were three others in whom both tests were negative in the face of convincing evidence to the contrary. In two of these chemotherapy was responsible for the tests being negative. Comparing the merits of the two systems of examination, the selective and the routine, Beskow concluded that the former was reliable enough and much more economical.

Tropical Diseases.—Since March, 1955, facilities have been provided at the Jönköping fever hospital for the treatment of patients with tropical diseases hitherto scattered throughout Sweden. Dr. O. Gabinus (*Nord. med.*, March 27, 1958) reported 156 patients coming from the tropics have been examined for some tropical disease. Of these 24 were admitted to the hospital. Most of the 16 cases of malaria were diagnosed without microscopic evidence during a parasite-free interval, by means of an enlarged spleen, anemia, and recovery from various symptoms under treatment with chloroquine and primaquine. Infestation with the tissue nematodes was found in 41 patients including 19 with filariasis and 20 with acanthocheilonemiasis. The diagnostic complexity of the task was increased by the possibility of more than one nematode infestation in the same patient. Such duplication was observed in seven patients, and there was one with a triple infestation.

Hitler and Parkinsonism.—Professor K. A. Ekbom (*Svenska läk.-sallsk. förhandl.*, March 28, 1958) reported that it was not till 1945 that Hitler was said in public to be suffering from paralysis agitans. What was, perhaps, the clearest account appeared in 1951 when Guderian published his reminiscences of Hitler from whose presence he was banished for 14 months. At the end of this interval he was struck by the complete change in Hitler's appearance. His left hand trembled, he stooped, and his expression was stony. These changes were progressive, and after the attempt on his life in July, 1944, the trembling extended from his hand to the whole of his left side. To mask this he used to cover his left hand with his right. His gait was dragging, his movements were slow, and his attendants had to slip a chair under him when he was about to sit down.

Pulmonary Tuberculosis of Old Age.—At the chest hospital to which he is attached, Dr. T. Bruce (*Quart. J. Swedish Nat. Tuberculosis A.*) noted that 20 years ago only 5% of the patients were over 50 years old. At present barely 25% of the recently admitted patients are under 35, while more than 33% are over 50. Before it can be argued that tuberculosis has become more frequent than it was in the elderly, account must be taken of the increased expectation of life and the greater proportion of old persons in the population. Källqvist has shown that in the last 15 years there has been practically no change in the frequency of pulmonary tuberculosis among persons over 50 but the declining incidence of pulmonary tuberculosis among the young, thanks to BCG vaccination, should ultimately improve the outlook for older persons.

UNITED KINGDOM

Bronchitis in Britain and Denmark.—In England and Wales bronchitis causes 25,000 deaths a year, accounting for 50% of the deaths due to respiratory disease and 5% of those due to all causes. These figures are much higher than those of other European countries and the United States. Christensen and Wood compared the mortality due to bronchitis in England and Wales with that in Denmark and investigated some of the possible factors responsible for the high prevalence of the disease in the former country. The mortality from bronchitis in England and Wales is 15 times that in Denmark. The excess mortality in England and Wales occurs at all ages for both sexes, although male mortality is much greater than female. In England and Wales the mortality from bronchitis is much greater in the towns than in rural districts, in contrast to the situation in Denmark where there is little difference in the two regions. A possible explanation of the greater mortality from bronchitis in England and Wales is its greater urbanization with accompanying atmospheric pollution. Another factor may be the difference in the national smoking habits of the two countries, the cigarette consumption of England and Wales being twice that of Denmark.

Reduction of the Side-effects of Morphine.—Shaw and co-workers (*Brit. M. J.* 1:675, 1958) used cyclizine hydrochloride, an antihistaminic and amiphenazole, an analeptic used in the treatment of barbiturate poisoning, to control the side-effects of morphine. The use of cyclizine was suggested by Professor Shaw's earlier work indicating that some of the side-effects of morphine might be due to histamine release. Amiphenazole was used to counteract the mental depression caused by morphine. The initial tests were made on 46 volunteers, who were given 30 mg. of morphine. The main side-effects produced by this dose were dizziness, nausea, ataxia, mental depression, and tremor, which occurred in all the volunteers. In addition vomiting was noted in 62%, itching in 75%, and difficulty in micturition in 75%. All volunteers found it necessary to lie down on account of the side-effects. Forty subjects were then given 30 mg. of morphine parenterally and 50 mg. of cyclizine hydrochloride by mouth. This reduced the incidence of nausea from 100 to 42% and of vomiting from 62 to 25%. There was also some reduction in the incidence of dizziness, tremor, and difficulty of micturition. Only 40% of the volunteers found it necessary to lie down on account of side-effects in contrast to 100% given morphine alone. Amiphenazole in a dose of 40 mg. reduced the incidence of central-nervous-system depression from 100 to 45% and to a slight extent some of the other side-effects, although not as much as the cyclizine. The tests were repeated on 28 students, in whom morphine-induced vomiting was reduced from 57 to 11% by the use of cyclizine and amiphenazole. The authors have given up to 200 mg. of morphine for the control of chronic severe pain in 400 patients, covering the side-effects with 50 mg. of cyclizine and 40 to 100 mg. amiphenazole.

The Stiff-Man Syndrome.—The stiff-man syndrome, described by Ascher and co-workers (*Brit. M. J.* 1:265, 1958), consists of a relentlessly progressive stiffness of muscles in the limbs and trunk, interspersed with painful spasms in the affected groups, which may be severe. The syndrome does not resemble any known disease, although the attacks resemble and are as severe as the muscle spasms of tetanus. No treatment has been found to arrest the disease or to relieve the pain. Each attack starts suddenly at any time, the calves of the legs being the parts mainly affected, although other muscle groups, such as those in the thighs, buttocks, back, chest, hands, and arms may be affected. There is often associated retention of urine. The muscles become rigid with the consistency of iron and show a coarse fibrillation. The attacks, which are described as agonizing, may last a few hours or several days. Apart from the spasms the general health my be good. Examination of two subjects with the syndrome revealed no abnormality except inability to elicit some reflexes owing to the muscle stiffness. The muscles appear normal in sleep and under anesthesia. Treatment with mephenesin, quinine, and chlorpromazine proved useless, and large doses of meperidine and morphine did not relieve the pain completely. Electromyography showed a normal pattern of discharge, and muscle biopsy revealed nothing abnormal. The only abnormality found was a disturbance in phosphorus metabolism. A glucose tolerance test was followed by a rise instead of the expected fall in the serum inorganic phosphate level.

Alternative to Tranquilizers.—There is reason to believe that tranquilizers are being used too often and indiscriminately. Rathod described the treatment of two wards of chronic refractory mental patients, by tranquility achieved by drugs and by improvement of the patients' environment. The two wards contained chronically disturbed psychotic women, mainly schizophrenic, ranging in age from 20 to 80 years. About 90% of them had been hospitalized for their mental condition for three or more years, during which time chlorpromazine or mepazine had been given. Without the knowledge of the patients or nurses the drugs were replaced by placebo tablets of indentical appearance, and at the same time intensive and varied occupational activities were introduced, such as teasing wool, needlework, knitting, games, physical training, musical evenings, and the formation of occupational therapy groups. Patients were also encouraged to take part in other recreational activities and to work in the departments of the hospital. Better and closer staff-patient relationships were fostered so as to create a friendly atmosphere. Data were collected from the nurses' reports, and the behavior of the patients under the tranquilizing regimen and occupational activity was compared. The results showed that changing the patients' environment and giving them occupational interests produced results just as good as those initially obtained with tranquilizers. The initial improvement resulting from the giving of chlorpromazine and mepazine was not maintained. Improvement occurred while placebos were being given, suggesting that they have some therapeutic value. Their withdrawal led to deterioration. Rathod concluded that giving the mental patient some interest in life produces results just as good as those obtained by the administration of tranquilizers. The use of the latter exposes the patients to possible toxic effects and the hospital to unnecessary expense.

Mass Radiography.—Mass radiography of the general public for the discovery of new cases of tuberculosis has been criticized on economic grounds. McDowell (*Lancet* 1:632, 1958) showed that if used selectively it is of great value in picking up new cases. He agreed that random examination of all and sundry was wasteful. In the Birmingham region mass-radiography case-finding activities fell into two main categories. First, and most rewarding, were group-radiography sessions for the examination of groups likely to show a high prevalence, such as patients referred by general practitioners on suspicion, contacts with active cases, tuberculin-positive children, and teachers. Second, there were mass surveys of factory employees, older schoolchildren, and the general public, where the purpose was to radiograph large numbers of persons as expeditiously as possible to filter off those with symptomless active tuberculosis.

In addition to case finding, protective surveys were also made, the intention being to protect either a group or the individual rather than to find a high incidence of tuberculosis. These surveys included such groups as young recruits to armed forces, antenatal patients, students, and persons working with children. Mobile units were used for much of this work. The combination of group and mass radiography picked up 1,220 active cases in one year, the largest number of cases in any region. Half the active cases were infectious. The early minimal lesion of routine mass radiography is replaced in group radiography by a more extensive and sometimes cavitating condition. One more source of infection in the community is thus found and removed. The search for contacts has not the same urgency as the discovery of the minimal lesion. McDowell recommended that a mass radiography unit should consist of a static 100-mm. unit for group radiography and a lightweight mobile unit for mass surveys of selected high-prevalence groups. The static unit should be in the main hospital for the industrial area, where it can be used according to local demand. At other times it could be used for routine radiography of outpatients and for follow-up examinations. In 1956, 30% of all the reports of cases of respiratory tuberculosis in the Birmingham region came from the mass radiography service.

Infective Polyneuritis.—A. M. G. Campbell (*Proc. Roy. Soc. Med.* 51:157, 1958) believes that the virus of feline enteritis may be the causative organism of infective polyneuritis. He treated six patients in whom the onset of the disease was directly related to an illness of the patient's cat, and he has heard of five other such cases. Typical of these cases was that in which a woman developed infective polyneuritis about a month after her kitten had what was probably feline enteritis. She herself attributed the illness to contact with the kitten, which she had nursed throughout its illness. A farm laborer who developed infective polyneuritis sent his cat to a woman 40 miles away to be cared for while he was ill. A month later the cat sickened and died of feline enteritis and the woman aged 65 was admitted to hospital with infective polyneuritis, from which she died 10 days later. There appears to be strong circumstantial evidence that this syndrome is at least occasionally linked with an illness of cats. Feline enteritis is a viral disease which is highly infectious among cats, chiefly affecting young cats and kittens. Probably 70% of all cats are infected at some time. Complement fixation reactions have been carried out on the serum of patients with infective polyneuritis, using as antigen spleen and lung tissue from cats infected with feline enteritis virus. The results suggest that there is a distinct difference between the patients' blood and the blood of controls.

A Distinguished Octogenarian.—To commemorate the 80th birthday of Sir Gordon Gordon-Taylor, on March 18, the *British Journal of Surgery* issued a special Gordon-Taylor birthday number. Sir Gordon continues to take an active interest in his profession. Among other honors he holds an honorary fellowship in the American, Australian, and Canadian Colleges of Surgery, and his honorary degrees include the LL.D of Toronto and Melbourne and the M.D. of Athens.

Pulmonary Moniliasis.—McKendrick and Medlock (*Lancet* 1:621, 1958) treated a 9-year-old girl, who had pulmonary moniliasis complicating a case of fulminating influenzal pneumonia and whose chances of recovery appeared remote, with sulfadiazine and hydrocortisone. Two days after admission to hospital a heavy growth of Candida albicans was obtained from her sputum; 500,000 units of nystatin were given every six hours by mouth for eight days, and 500,000 units were introduced every four hours by nebulizer into her oxygen tent for four days. The aerosol was made by mixing 500,000 units of nystatin with 15 ml. of distilled water and atomizing this at a flow rate of 6 liters a minute, which exhausted the solution in about an hour. The child ultimately recovered. The authors were much impressed by the speed with which C. albicans disappeared from the sputum under treatment with nystatin, and they believe that the inhalations were the decisive factor in this. The child later returned with evidence of bronchiectasis at the base of her eft lung, and Candida organisms were again recovered from her sputum. Her general condition, however, was excellent, and the view was expressed hat the fact that Candida organisms were not completely eliminated in the acute stage does not alter the fact that the nystatin given by aerosol played an important part in her survival.

National Library of Medicine.—The medical secion of the Library Association sent a memorandum o the Minister answerable to Parliament for the Department of Scientific and Industrial Research, which is planning a national lending library of cience and technology. The association is gravely oncerned because it is not intended to include medicine in the coverage of the new library. The memorandum referred to the service rendered by he National Library of Medicine at Washington, which is not only national but international, seting an example that has been the admiration of British medical librarians. The Royal Society of Medicine and the British Medical Association both have excellent libraries but lend books only to their members. Their stocks are insufficient in any case for interlibrary lending. The memorandum pointed out that it is not only the medically qualified that need a national medical library but also, and often to an even greater extent, those research workers with scientific qualifications working in allied fields. Access to medical literature is difficult for them. Medical institutions and research organizations cannot hope to cover all the books and journals necessary for research workers. If they are isolated from cities they cannot have extensive access to medical literature. Moreover the advances in medicine are recorded not only in journals but also in symposiums, research conference proceedings, and transcripts of tape recordings and by other means. These records cannot be provided by the individual working library, nor would it be economical for it to attempt to do so. Although each unit should have a working library there must be a central source of medical information. The needs of both medical and scientific workers might be met by providing a national library of medicine. This would be a supplement to, not a substitute for, local resources and would be best based on the existing collections of the Royal Society of Medicine. The new medical library could cooperate with the proposed National Lending Library of Science and make its services available on the same lines. If such a plan is not possible, the proposed National Lending Library of Science and Technology should consider covering in its science section the whole field of medicine in its broader aspects.

Suicide After Watching Television.—At an inquest at Havant, on a woman of 38 found with her head in a gas oven, her husband said that a television series entitled "Your Life in Their Hands" had profoundly affected her. Details of operations were shown and discussions held on cancer and its treatment. The woman's husband said that she feared she had cancer. At autopsy no evidence of cancer or of any other disease was found. The woman had previously worried about her eyes and had threatened suicide. The coroner returned a verdict of death from poisoning by carbon monoxide, which was self-administered while the woman's mental balance was disturbed. This was the second case of suicide attributed to mentally unstable persons viewing the B. B. C. telecast entitled "Your Life in Their Hands."

Physicians Build Hospital.—The New Victoria Hospital, New Malden, Surrey, is the first voluntary hospital to be built since before World War II. It is also the first hospital independent of the state medical service to be opened since all the hospitals were nationalized 10 years ago. It would require a fresh act of Parliament to nationalize the new hospital. It cost $85,000, has 20 beds, and is managed by the local general practitioners.

Increased Pay for Service Physicians.—Increased rates of pay and marriage allowances are announced for doctors in the armed forces. This increase is timely as the rates of pay have always lagged behind those of physicians in civil practice and in the hospitals aided by the state. Even now a medical officer with the rank of lieutenant general earns about $3,500 a year less than a top hospital specialist. The new rates of pay apply only to regulars who have contracted to remain in the service for several years and who are based in the United Kingdom. The new annual rate of pay for an entrant, with the rank of acting surgeon-lieutenant (navy), lieutenant (army), or flying officer (air force) is $1,850, which is increased on marriage to $3,000. The pay of a surgeon commander, lieutenant-colonel, or wing commander, becomes $4,665, increased on marriage to $6,100. The highest pay is that of a surgeon vice-admiral, lieutenant-general, or air marshal, who receives $10,525, with a marriage allowance of $1,870. In addition all officers receive rations in kind or an allowance in lieu, amounting to $200 to $610. Education allowances have also been increased.

Blood Tests not Enforceable.—In a paternity case in Edinburgh an attempt was made to persuade the court to order a mother to submit herself and her daughter to a blood test. The case was one in which a corporal was seeking a divorce on the grounds of his wife's adultery. The court refused to make the order and dismissed the husband's appeal for lack of evidence. It was argued that the court, if it enforced the order, would be responsible for the compulsory infliction of a surgical operation, albeit a minor one, and this would be in law an assault on the person. The position with respect to the daughter was that as an infant she could not consent to an operation. As she was not even a party to the suit, it was impossible to compel her to submit to an operation to provide evidence. Without a test on the child, any test on the mother would be valueless.

Postoperative Metabolic Changes.—It is generally taught that after operations there are certain inevitable metabolic changes, such as negative nitrogen, potassium, and sodium balances. Abbot and co-workers (*Lancet* 1:704, 1958) presented evidence that operative trauma and anesthesia per se are only minor factors in determining the pattern of metabolic response to injury. They stated that the major factors are the dietary regimens, the complications, the previous nutritional state, and the sex of the patient. They believe that the impression gained by other workers that the postoperative metabolic disturbances are inevitable was due to the effects of an insufficient supply of calories, nitrogen, and electrolytes. By administering intravenously a solution containing 5% protein hydrolysate in 10% fructose solution and sufficient sodium and potassium salts to provide 75 to 125 mEq. each of sodium and potassium, the authors found that postoperatively patients need not lose excessive amounts of nitrogen, sodium, and potassium or lose weight. If there is extensive blood loss and if necrotic tissue or serious infection are present, large losses of these components occur. Although infection, hemorrhage, and tissue damage greatly increase caloric needs and accelerate metabolic processes, these effects can be minimized by an adequate intake of calories, protein, and electrolytes. At the same time, infection must be controlled, necrotic tissue removed, and blood loss corrected, if the patient's weight and the nitrogen and electrolyte balances are to be maintained.

Cost of Unnecessary Absenteeism.—Dr. H. W. Ashworth, a general practitioner in Manchester, investigated the extent of unnecessary absence from work by patients in his practice, a total of 3,300. Over a period of a year, during which the average number of items of service per year given to each patient was 4, he estimated that there were 10 for malingerers. These were refused certificates exempting them from their work and entitling them to sick pay. Sickness certificates were, however, issued to 44 women and 54 men, who extended their absenteeism beyond the time considered necessary on medical grounds. The women made 53 unjust claims and lost 634 days' work unnecessarily, for which they drew sick benefit. The men made 61 unjust claims and lost 640 days' work. Most of the women were married. In the same period 114 women and 209 men claimed sick benefit honestly. They lost 3,143 and 6,561 days' work respectively. There were also a group of 15 women and 17 men belonging to the chronic sick, accounting for 4,368 and 5,544 days respectively away from work. Dr. Ashworth estimated that 20% of those who claimed sickness benefit made a claim that was unnecessary or unduly prolonged. Of 21,754 days lost through sickness, 1,274 were lost unnecessarily. Social and domestic conditions sometimes provided extenuating circumstances, although the medical grounds were insufficient. This accounted for the absenteeism of 14 women and 11 men. It is calculated that 5% of the money paid out in sick benefit is unjustly drawn. In this group of 3,300 patients there is a hard core of 15 women and 17 men who unjustly draw about $10,415 a year in sick pay between them. Throughout the country a total of 2,352 billion dollars would be paid out annually in sick benefit on the basis of these figures of which 70 million dollars would be claimed unjustly.

CORRESPONDENCE

ESTROGENS TO INHIBIT GROWTH

To the Editor:—In view of the possible encouragement to practitioners to administer estrogens to tall peripubescent girls, there are some pertinent points in the interesting article of Dr. S. Charles Freed in THE JOURNAL, March 15, 1958, page 1322, wherein he describes the results of such therapy on two patients.

First, Dr. Freed does not state (*a*) the possible measurement errors of incremental growth in height. In measuring increments in six-month periods where one is dealing with such gains as 4.0 cm. to 0.32 cm., for instance, measurement error can be a very vital factor. He does not state (*b*) how he predicted the amount the patient would grow in height before maturity. Bayley and Pinneau (*J. Pediat.* 40:423-441 [April] 1952) have shown the potential errors in such prediction before the age of 12 years and have suggested that supplementary tables are needed for children advanced or retarded in development. Accuracy of skeletal age assessment is clearly vital. Dr. Freed does not state (*c*) how he assessed the "normality of bone age." It is assumed that this means a bone age of the chronological age of the child and that the Greulich & Pyle atlas was used. Unfortunately in the peripubertal period, especially in the female where the total puberty period is so concentrated, this method of assessing skeletal maturity status when a fine measure is needed is sometimes not truly adequate for this purpose. He does not state (*d*) in what stages of puberty were both the patients and through what phases of this period they passed during observation. Most workers agree that there are five arbitrary stages, and these are of great help in assessing the progress in such cases (Reynolds and Wines, *Am. J. Dis. Child.* 75:329-350 [March]; Tanner, Growth at Adolescence, Springfield, Ill., Charles C Thomas, 1955).

Second, the crux is, at what stage of the puberty stature spurt were the patients when therapy was started? It is a well-established and accepted fact that menarche occurs almost invariably after the apex of the height spurt has passed (Tanner, 1955). A table constructed from Doctor Freed's data, standardizing incremental periods at six months, and interpolating from his stated velocity data at the beginning of therapy shows certain patterns.

On the evidence given, either of these patients could, in fact, have passed the time of the apex of their height spurt, and the data could just as well *indicate two girls who were somewhat constitutionally tall*, who had reached their maximum height gain early and were on the descent, and who physically matured at an earlier than average age.

Third, it is interesting that the incremental curves in both cases are bizarre and show a sharp decline after the initial assessment of velocity (and this certainly coincided with the start of therapy), but then in the second six months the curves rise again (still during therapy) before falling off to zero. This may be explained by errors of measure*ment or by an initial effect of the therapy to di*minish height gain and then by a lessening of the effect. Doctor Freed has also postulated that (*a*) chondroplasia (as measured by height gain) is inhibited by estrogens and (*b*) osteogenesis (as measured by "bone age" assessment) is greatly accelerated.

Data on Dr. Freed's Two Patients

	Case 1		Case 2	
Patient's Age, Yr	Height Achieved Cm.	6-Monthly Increments, Cm.	Height Achieved, Cm.	6-Monthly Increments, Cm.
11	...	...	165.5	...
11½	160.0	...	169.0	3.5
12	163.0	3.0	170.0	1.0
12½	164.0	1.0	171.0	1.5
13	...	2.0	173.0	2.0
13½	168.0	2.0	173.0	0.0
14	168.32	0.32	174.0	0.7
14½	168.32	0.0	...	...

Before this can truly be evaluated it will be necessary (*a*) to match a reasonable number of treated and untreated tall prepubescent girls; (*b*) to assess skeletal maturity status by as fine a measure as possible (Tanner, *Proc. Centre Int. de l'Enfance Conf. on Growth Studies*, Brussels, 1958) and, in any case, concomitantly with regular height measurements; and (*c*) to record, also concomitantly, the stages of puberty through which the patients are passing. On the evidence so far it might be wise to carry the study of the place of estrogen therapy in such cases a little further before recommending it to physicians.

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LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Malpractice: Translumbar Aortography; Res Ipsa Loquitur.—This was an action for damages resulting from the alleged negligent performance of a translumbar aortogram. From a verdict and judgment in favor of the plaintiff, the defendants appealed to the district court of appeal, first district, division 1, California.

The plaintiff was 55 years of age with a history of eye condition indicating premature aging. He was referred to Dr. Gerbode, one of the defendants, by his family physician. His chief complaint, when Dr. Gerbode examined him, was cramping pains in his legs, mostly in the calves, causing intermittent limping. This condition had started gradually, becoming increasingly more severe. He complained of pain in his hips and lower back on exercise. He also had abdominal pain on the right side. No pulses below the femoral pulse on each side were palpable. There was a weak femoral pulse on the left and none on the right. The legs blanched when they were raised. This is a characteristic of advanced arterioinsufficiency. Dr. Gerbode diagnosed a probable occlusion of the abdominal aorta, which had impaired the blood supply to the legs and other areas, and an advanced arteriosclerosis. He advised the plaintiff that he had evidence of serious circulatory disturbance, that the examination indicated that plaintiff might have a block in his abdominal aorta, and that there was something else wrong, as shown by the pain in his right side and back. Dr. Gerbode told the plaintiff of the seriousness of his condition and urged that the plaintift enter the hospital for a thorough evaluation of his condition; that one of the things the doctor wished to have done was a study of the plaintiff's aorta, which would entail an anesthetic and an injection of some material into the aorta to localize the block; also x-rays of his gastrointestinal tract would be taken. Dr. Gerbode stated that if the clinical findings were borne out by the examination contemplated, his condition would be helped by an operation removing and replacing a segment of the aorta. Such an operation would improve the circulation to his legs and back and prolong his life.

The plaintiff entered the hospital, and Dr. Gerbode requested in writing that the aortography be performed by the hospital's x-ray department. The normal procedure in such cases is for the attending surgeon to tell members of the house staff team who are to perform the procedure basically what the problem is. Dr. Gerbode did this with Dr. Ellis and Dr. Andrews of the staff. Dr. Ellis was to perform the aortography. He had had five years' practice in surgery and was in charge of all special diagnostic procedures at the hospital, such as aortographies, that had to do with the injection of radio-opaque or contrast material in various arteries and blood vessels of the body.

Dr. Ellis called on the plaintiff in his hospital room and informed him that he was to do the aortography. He explained that he would inject some material into the aorta and take films at that time to see if they could ascertain the precise condition of plaintiff's circulatory system. On the afternoon of Jan. 8, Dr. Ellis went to the x-ray room, where the plaintiff was lying on a table. Present were the anesthesiologist, the radiologist, and several technicians. Dr. Gerbode was there at the beginning of the procedure but gave no instructions and did not participate in any way. The plaintiff was already anesthetized and asleep. Dr. Ellis was inserting the needle into the plaintiff's aorta when Dr. Gerbode came in the room. As the patient was apparently in good condition, Dr. Gerbode left and did not see the patient again until the next morning.

An aortography is a procedure requiring an anesthesiologist, a radiologist, and a surgeon. The function of the surgeon is to insert the needle necessary for the injection of material into the aorta and to discuss with the radiology department the materials used and the timing. A hollow No. 16 or No. 18 needle is used. The hollow is closed with a metal rod or stylette. It is approximately .03 in. in diameter and 6 in. long. The patient is placed on his abdomen, face down on the table, and given a general anesthetic. A sensitivity test is then done to determine if the patient is sensitive to the radio-opaque material to be used. The needle is inserted to the left of the spinal column approximately 3 to 4 in. to the left of the midline of the back underneath the 12th rib. The needle is inserted in an upward direction toward the front of the body so as to enter the aorta which lies in front of the spinal column. The material used in this case was a 70% solution of sodium acetrizoate (Urokon sodium). One cubic centimeter of it was injected into a vein in the plaintiff's arm, and he appeared not to be sensitive to it. After the surgeon feels the needle penetrate the wall of the aorta, a metal rod is removed from the needle and blood flows from the aorta through the hollow needle. A syringe is then attached to the needle. In this case 30 cc. of sodium acetrizoate were then injected at a fairly rapid rate. The defendant's witnesses testified that there was no difficulty in inserting the needle on the first attempt and that it was only inserted once. The injection took only a few seconds, and then a series of x-rays were immediately taken by a machine already in position. While the films were still wet Dr. Ellis and the radiologist examined them. They showed that the descending aorta in the abdomen just below the vessels leading to the kidneys was blocked, and it seemed desirable to take additional x-rays in order to determine the extent or length of the block. During this time the plaintiff was kept under anesthesia and the needle remained in place, it being the custom so to do while the doctors are determining whether additional x-rays are necessary. This obviates the necessity of again inserting the needle. The doctors hoped that by changing the timing of the pictures in relation to the time of making the second injection they might be better able to delineate the vascular tree. Twenty cubic centimeters of sodium acetrizoate were then injected, without changing the position of the needle, and additional x-rays were taken, particularly of the body further down than in the first pictures. The entire procedure seemed to proceed in a normal manner, and the patient seemed that evening to have recovered from the anesthesia. The next morning when the plaintiff awoke his lower extremities were paralyzed.

The trial court had instructed the jury that the doctrine of res ipsa loquitur applied in this case, and the defendant's principal contention on appeal was that such instruction was error. The application of the doctrine in malpractice cases, said the court of appeal, is a development of comparatively recent years. Before that time, the facts that medicine is not an exact science, that the human body is not susceptible to precise understanding, that the care required of a medical man is the degree of learning and skill common in his profession or locality, and that even with the greatest of care untoward results do occur in surgical and medical procedures, were considered paramount in determining whether the medical man in a given circumstance had been negligent. But gradually the courts awoke to the so-called "conspiracy of silence." No matter how lacking in skill or how negligent the medical man might be, it was almost impossible to get other medical men to testify adversely to him in litigation based on his alleged negligence. This fact, plus the fact that usually the patient is by reason of anesthesia or lack of medical knowledge in no position to know what occurred that resulted in harm to him, forced the courts to attempt to equalize the situation by, in some cases, placing the burden on the doctor of explaining what occurred in order to overcome an inference of negligence.

The great difficulty in the application of the doctrine, continued the court, is in determining where to draw the line. To apply it in all cases where an unexpected result occurs would hamstring the development of medical science. No medical man would dare to use new procedures, especially in surgery, because if injury resulted he would be prima facie guilty of negligence. Medical science has developed in leaps and strides in the past few years. Procedures that 40 years or even 10 years ago would have been considered impracticable and fatal are now being successfully used; for example, surgery upon the heart. Even the procedure used in this case, translumbar aortography where the aorta is punctured and a foreign substance injected in order to determine the location of a suspected block, is one which but a few years ago would not have been attempted but one which is of great value in determining whether corrective surgery is needed and advisable. Thus a great responsibility rests upon the courts to determine the point at which the doctrine will apply in order to be fair to a patient who has received a result which according to common knowledge of either laymen or of medical men ordinarily would not occur without negligence and to be fair to medical men if there is a result which could occur without negligence and which should not impose upon them the presumption of negligence.

There can be little question, the court concluded, but that aortography and its results, because it is a relatively new diagnostic procedure, is not a matter of common knowledge among laymen. Very few laymen have ever heard of it. So far as laymen are concerned, it cannot be said that it is a matter of common knowledge that injury results only where there has been negligence in its use. Particularly is this so where it is performed upon a person with the advanced degree of arteriosclerosis possessed by plaintiff. It is a matter outside the realm of the layman's experience, and hence common knowledge as a basis for the application of the doctrine does not exist.

Was there any professional evidence calling for the application of the doctrine? There was no medical testimony upon which res ipsa loquitur could be based unless it was the testimony of the plaintiff's expert that the needle may have been inserted in the wrong place. There was no testimony that in aortography, without negligence, a needle could be inserted in a spinal artery. In fact, the testimony was just to the contrary, that there should be no great difficulty in inserting the needle in the aorta. There was, said the court, a conflict in the testimony, the defendant's experts testifying in effect that the sodium acetrizoate could have affected the spinal cord even if properly injected in the aorta and that such a situation might have occurred here; the plaintiff's expert testifying in effect that the x-rays showed the needle to have been inserted in the wrong place. The jury were not told that the doctrine could apply only in the event they found that the needle had been inserted in the wrong place. On the contrary, the court instructed the jury that as a matter of law, from the "happening of all the events involved in this case, however, as established by the evidence" the inference of negligence arose. The jury were given no opportunity to determine the facts upon which the doctrine would or would not arise. This was prejudicial error.

The defendants also contended that the trial court had erred in holding the defendant Gerbode personally liable for any negligence there might have been in the performance of the aortography. Four doctors testified that it was not customary for the attending physician to perform, or to be present at the performance of, an aortography, and that it is customary to have such a procedure performed by the hospital personnel who are accustomed to working together in the performance of this and other complicated diagnostic procedures and perform them regularly. While Dr. Gerbode ordered the aortogram, and would be responsible for any negligence in prescribing such procedure, he cannot be held liable for the negligence of the team in the actual performance of it, as he neither participated in, nor had the right to direct it. When a patient is placed in a hospital his attending physician orders many procedures to be undertaken by the hospital staff or employees. The attending physician cannot be held liable for acts over which he had and could have no control. To hold that the attending surgeon who does not participate nor have the right to participate in the procedure is liable for the acts of a competent team supplied by the hospital would be against the best interests of patients generally. The patient, by the use of such team, gets the benefit of medical people who have become experts in the particular procedure. Other arguments attempting to hold the defendant Gerbode personally responsible were also overruled.

Another contention raised on appeal involved the legal effect of a manufacturer's brochure. The trial court gave an instruction to the effect that if a surgeon seeks fields of experimentation in treating his patients he is accountable for any damages proximately caused by any unskillful treatment of the patient. A further instruction was given to the effect that if sodium acetrizoate was injected in greater amount than that recommended by the manufacturer's brochure and if the jury found that such injection constituted experimentation, then all participating would be guilty of negligence unless the patient was first warned of the experimentation and consented to it. The first question to be considered, said the court, is the admissibility of the brochure. It was published by the manufacturer of the sodium acetrizoate. It stated that for translumbar aortography in an adult, "10 to 15 cc. of 70% Urokon is adequate" and that aortography should not be repeated within 24 hours. The plaintiff contended that this negatived a second injection. The defendants contended that it negatived only a second insertion of the needle. The uncontradicted evidence was that the second injection, if deemed necessary, is customary. In the "first run," in the plaintiff's case, 30 cc., and in the "second run" 20 cc., a total of 50 cc. were injected. There was no expert testimony that the amount used was improper. In fact there was testimony that as high as 50 cc. were customary on the first run. The court thought it was significant that the brochure recommended the use of 50 cc. of sodium acetrizoate in another procedure involving injection of the contrast medium for visualization of the heart itself.

The defendants and amicus curiae urge that a manufacturer's brochure is not admissible in evidence and does not establish a standard of care. They contend that a drug manufacturer's recommendations are always conservative and are quickly outdated, that the manufacturers expect, and the custom is, that after a material has been available for a period of time, physicians using it rely primarily on their own experience and the published literature of colleagues concerning its use in actual practice. They contend that the miraculous developments that have taken place in the effective use of antibiotics and other drugs might never have been accomplished if physicians were required to follow blindly the suggestions of the manufacturers who prepare but do not use them.

The court of appeal said that the brochure was admissible but that it cannot establish as a matter of law the standard of care required of a physician in the use of the drug. It may be considered by the jury along with the other evidence in the case to determine whether the particular physician met the standard of care required of him. The court also held that the mere fact of a departure from the manufacturer's recommendation, where such departure is customarily followed by physicians of good standing in the locality, does not make that departure an "experiment." There was in this case no evidence of experiment, and the instructions concerning "experiment" should not have been given.

Because of the ruling of the trial court on the question of res ipsa loquitur, and for other reasons, the verdict of the jury in favor of the plaintiff was reversed and the cause remanded for a new trial. *Salgo v. Leland Stanford Jr. University Board of Trustees, et al*, 317 P (2) 170 (Calif.) 1957.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Farmer's Lung—A Form of Pneumoconiosis Due to Organic Dusts. R. C. Frank. Am. J. Roentgenol. 79:189-215 (Feb.) 1958 [Springfield, Ill.].

Farmer's lung, which has been described also under several other terms such as thresher's lung or harvester's lung, has received little attention in the American literature. The author presents observations on 27 patients with farmer's lung, some of whom have been followed up for 6 years to evaluate the presence of complications and permanent disability. Gradations in severity occurred. The syndrome developed after exposure to dusts in the handling of moldy hay or silage. Moldy grains were occasionally indicted, and even plain silage was not infrequently at fault. Symptoms in a few patients followed inhalation of the "steam" of silage, but this occurred weeks after ensiling on "opening" the silo and, therefore, would not likely be due to nitrous dioxide, the agent believed responsible for silo-filler's disease. Shredded corn stalks and dust from fresh hay and grain were also responsible for some cases. A minor form of the disease apparently occurs, involving dyspnea, chills and fever, and night sweats lasting a day or 2 after exposure to clouds of dust associated with threshing fresh grain. The symptoms pass quickly and are not followed by permanent disability. No cases of this minor form are included in this series. A typical acute episode is characterized by increasing dyspnea, cough which is usually nonproductive, fever and chills, night sweats, and weight loss.

The onset of the disease in the 27 patients reviewed followed 3 clinical patterns. The 11 patients of group 1 included the most spectacular ones, in that the acute attack followed a single exposure to unusual quantities of moldy hay, grain, or silage in the case of all but 1 patient. The exception was exposed to silage "steam" on opening the silo. In group 2 (9 cases), symptoms occurred after repeated exposure to moldy hay, grain, or silage over a period of time, usually a winter season. Patients of group 3 (7 cases) complained of symptoms after exposure to different inciting agents over a period of years. The severe acute exacerbation then occurred without any one particularly outstanding episode of exposure. These patients mostly had apparent sensitization to corn silage rather than to moldy hay. The author believes that 2 reactions are probably involved in the disease process. There is an initial pulmonary response to inhalation of organic dusts, involving a granulomatous reaction with associated interstitial fibrosis. Later sensitization to such dusts is believed to occur, and there is progressive pulmonary fibrosis on repeated exposures.

The dusts involved are most often those from moldy hay, grain, or silage, and the heavy fungal spore content of such dusts is believed largely responsible for the disease, although rarely the syndrome is due to vegetable dusts which are not very moldy. The pulmonary reaction to the fungal spores is due to their action as foreign bodies, and the disease is not believed to represent a pulmonary infection or mycosis. The causation and mode of progression of farmer's lung is still largely unknown, but present knowledge suggests that it is a form of pneumoconiosis due to organic dusts. A change of occupation should be recommended to patients with farmer's lung, and preventive measures should be advocated to save farmers from this disease. The author hopes that this report will stimulate further investigations into the many problems of this complex disease.

Trials of an Asian Influenza Vaccine: Fourth Progress Report to the Medical Research Council by Its Committee on Influenza and Other Respiratory Virus Vaccines. Brit. M. J. 1:415-418 (Feb. 22) 1958 [London].

Four vaccines were made from the egg-adapted line of the Asian influenza strain A/Singapore/1/57; vaccine A contained 20,000 hemagglutinating units per dose, vaccine B contained 14,000 units per dose, vaccine C contained 7,000 units per dose, and vaccine D contained 3,500 units per dose. The hemagglutinating units of virus were in each vaccine adsorbed onto 10 mg. of aluminum phosphate per dose, and the dose in each was 1 cc., inoculated deep subcutaneously into the upper arm. Two groups of 60 volunteers each, mostly young men in Army and Royal Air Force units, were divided into 4 subgroups, each to receive 1 of the 4 vaccines. Two serum samples were obtained from each vol-

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The place of publication of the periodicals appears in brackets preceding each abstract.

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unteer, the first just before inoculation and the second 3 weeks later. The antibody response to a single dose was low with each strength, although there was a somewhat greater response to the strongest. A second dose given 3 to 4 weeks later gave much greater antibody response.

The relative values of 2 doses, each of about 7,000 hemagglutinating units, 1 dose of about 7,000 hemagglutinating units, and 1 dose of 20,000 hemagglutinating units of the Asian influenza strain A vaccine were studied in field trials on volunteers, consisting of boys attending public schools, students at teachers' training colleges, and members of miscellaneous centers. The group of boys attending public schools were divided into 3 subgroups, 1 receiving 20,000 hemagglutinating units of the Asian influenza strain A vaccine, 1 receiving a polyvalent virus A vaccine, and 1 receiving a vaccine of the influenza B type. The groups of students at teachers' training colleges and the members of miscellaneous centers also were divided into 3 subgroups, 1 receiving 2 doses of 7,000 hemagglutinating units of the Asian influenza strain A vaccine, 1 receiving 1 such dose, and 1 receiving a vaccine of the influenza B type. A total of 3,093 persons were given 1 or the other of the 3 types of vaccine used. Severe epidemics of influenza took place in the public schools, and, subsequent to 8 days after the inoculation with 1 dose, a definite preventive effect was apparent in the group given Asian influenza strain A vaccine. After that interval of time the influenza attack rate fell to 33% of the attack rate observed in the other 2 subgroups given non-Asian influenza vaccine. The equality in the attack rate in these other 2 subgroups suggests that no protection against Asian influenza was conferred by the polyvalent virus A vaccine (although the young ages of the boys concerned may have been a factor in this). At a much lower epidemic level a similar protective effect of the Asian influenza strain A vaccine was observed in the groups of students at the teachers' training colleges and in the members of the miscellaneous centers.

Some Comments on Septicemia Due to Infection with Staphylococcus. P. Meriel and A. Fournie. Semaine hôp. Paris 34:392-399 (Feb. 12) 1958 (In French) [Paris].

The authors report on 5 men and 5 women, between the ages of 25 and 64 years, with septicemia due to infection with Staphylococcus pyogenes var. aureus, who were observed on a general medical ward of a hospital in Toulouse, France. Acute septicemia associated with endocarditis occurred in only 2 of these patients, 1 of whom died. The other 8 patients presented the subacute aspect of the disease with a local suppurative process as the principal feature; this may make the diagnosis difficult or may raise difficult problems concerning indications for surgical intervention. Metastatic abscess in the kidney, pyonephrosis, or a perinephric phlegmon occurred in 3 patients, and a focal nephritis in 6. Pyopneumothorax developed in 1 patient, an interhepatodiaphragmatic suppuration appeared in another, and the infection became localized in bones and joints in 2 patients. These observations suggest that there is still a relatively high incidence of septicemia due to infection with Staphylococcus organisms despite the increased therapeutic use of a large number of antibiotics with a broader action. The incidence of the subacute or chronic forms is on the increase and exceeds that of the acute and superacute forms. Blood cultures should, therefore, be practiced early and systematically in all patients with a febrile syndrome associated with chills and a sudden severe onset. This diagnostic method is simple, yields results rapidly (in general, within 24 hours), and is also of therapeutic value regarding the institution of treatment with antibiotics to which the pathogenic organisms are sensitive.

A Review of 182 Cases of Tetanus. R. Molphy. M. J. Australia 1:141-145 (Feb. 1) 1958 [Sydney].

The author reviewed the records of 182 patients with tetanus, who were treated at the General Hospital and at the Children's Hospital in Brisbane, with 2 objects in view: (1) to improve her own knowledge of the natural history of the disease and (2) to be able to recognize patients in whom curarization with intermittent positive-pressure respiration should be undertaken early. The 182 cases included some of each type of tetanus. There were 137 patients who had generalized spasms, and of these 76 (55%) died. The total mortality rate was 44%. There were 40 deaths among the 111 patients less than 20 years old (37%), whereas of the 8 patients over 70 years of age 6 died. Of all deaths, 83% occurred in the first week, and there were almost twice as many on the second day as on any other single day.

The average incubation period was somewhat longer in the patients who survived than in those who died. The period of onset proved to be the best guide to the severity of the disease. There were 137 patients with generalized spasms, and of these 83 (60%) had periods of onset of 48 hours or less. Of 35 patients who had periods of onset ranging from 4 to 24 hours, only 5 lived, and two-thirds of those who died did so in the first 3 days and as a direct result of uncontrolled spasms. Thirty-six patients had periods of onset ranging from 24 to 48 hours, and of these 12 lived; only one-third of the deaths resulted from uncontrolled spasms. In 79 patients spasms appeared after the second day or not at all; 20 of these patients died, none as a direct result of uncontrolled spasms. A significant pointer toward the advisability of instituting complete neuromuscular blockade early is the igh mortality associated with spasms in patients vith a period of onset of 24 hours or less.

The author stresses the need of careful nursing nd the extreme importance of postural drainage f pharyngeal secretions throughout the whole ill- ess. She thinks that, except in mild cases, the ntravenous route should be used as the mainstay n sedation to control spasms, as any other route ives too slow a control. Discussing the choice of rugs, she says that elixir mephenesin (Myanesin), hloral, and morphine can be used in mild cases nd for convalescent patients. If the patient can wallow well, then the tablets of mephenesin may e used. Mephenesin given intravenously has a lace in therapy in many cases of tetanus. It will apidly control the severity of spasms; the fre- uency is not so much affected. It can be com- ined with a hypnotic and an analgesic; for ex- nple, it may be used with chloral given orally nd morphine given subcutaneously, if the patient n swallow, or, if the patient has dysphagia, with henobarbitone and pethidine given intramuscular- . Mephenesin can also be combined in an in- avenous drip administration of 0.1% thiopentone olution and pethidine given intramuscularly. The anger of hemolysis or of respiratory depression ith the use of mephenesin can be avoided by eeping the dosage low.

dvances in Rabies Treatment: An Experimental valuation. N. Veeraraghavan, A. Balasubraman- n and T. P. Subrahmanyan. Bull. World Health rgan. 17:943-962 (No. 6) 1957 [Geneva].

Inquiries into various methods of treatment for bies have been in progress at the Pasteur Insti- ite of southern India during the past 3 years. In is paper a brief account is given of the important sults of treatment with (1) antirabies serum alone,) 5% Semple vaccine, (3) a combination of serum d vaccine, and (4) high-egg-passage, chicken- nbryo-adapted rabies vaccine with and without rum. Healthy guinea pigs, weighing about 400 m., were used in the protection experiments. ice were employed for serum neutralization tests. he challenge virus was the lyophilized canine bmaxillary gland suspension of a virus strain. ith a short needle, 0.1 ml. of the selected dilution the virus was inoculated into the right-sided strocnemius muscles of the guinea pigs.

When antirabies serum was given alone, either fore or after infection, it definitely prolonged the cubation period, but it had no saving effect. rum seemed to confer some protection when it as obtained from animals of the same species hich had survived an infection with the particular allenge virus. With doses of 5% Semple vaccine, mparable to those administered to human be- gs, it was possible to confer protection on animals against virulent strains of street virus, provided that the treatment was started 7 days before challenge. Combined therapy with serum and vaccine given after infection was of great value under certain conditions. There appeared to be an optimum in the relationship between the quantity of serum given and the antigenicity and dosage of vaccine administered. High-egg-passage Flury vaccine given before infection gave good protection. but serum and high-egg-passage Flury vaccine administered after infection were not of value against an Indian strain of street virus.

Peptic Ulcer in Poorer Communities of West Bengal: Analysis of 100 Proved Cases. S. C. Chatterjee, D. C. Das and S. N. Sengupta. J. Indian M. A. 30:35-42 (Jan. 16) 1958 (In English) [Calcutta].

The authors studied certain aspects of peptic ulceration in 100 patients who were admitted to a medical ward of a Calcutta hospital. Most of these patients were of the lower income groups. The series included 89 patients with duodenal ulcer, 8 with gastric ulcer, and 3 with concomitant ulcer. Thus, the ratio of duodenal to gastric ulcer was 11:1. There were 88 men and 12 women, representing a male to female ratio of 7.3:1. Duodenal ulcer was more common than gastric ulcer in both sexes, but while the ratio of duodenal to gastric ulcer was 16:1 in men, it was only 3:1 in women. The age of maximum incidence was in the third and fourth decades of life. A striking feature was that the Moslems had a relatively low incidence of peptic ulcer. In commenting on this fact, the authors point out that Moslems eat food cooked with onion and garlic, whereas Hindus do not. Garlic is a carminative and has actually been used in the treatment of peptic ulcer. It is possible that this herb has not only a curative but a prophylactic effect as well. Investigations on this question are being carried out. The symptoms of peptic ulcer varied widely, but complications, such as pyloric obstruction and hemorrhage, seemed to be rather frequent in these patients. Seventy-three per cent of the patients who had hyperchlorhydria had uncomplicated duodenal ulcer. but the authors are uncertain whether this has any definite significance. There was no relationship between gastric acidity and the chloride level of the blood.

Painful Nonsuppurative Swelling of Costochondral Cartilages (Tietze's Syndrome). E. H. Karon. R. W. P. Achor and J. M. Janes. Proc. Staff Meet. Mayo Clin. 33:45-53 (Feb. 5) 1958 [Rochester, Minn.].

Observations are presented on 13 patients with Tietze's syndrome (benign, painful, nonsuppurative swelling of one or more of the costochondral cartilages) who were encountered at the Mayo

Clinic during 1955 and 1956. The most common presenting syndrome is pain in the anterior thoracic wall, although rarely swelling of a costosternal juncture may precede the onset of pain. The pain is usually localized to the site of the affected cartilage, but it often spreads and may involve the neck, shoulders, or arms. The onset may be gradual or abrupt, with wide variation in severity. Inclement weather, anxiety, fatigue, and recumbency may intensify the pain. It may be aggravated by coughing, sneezing, deep breathing, or activity, and it may simulate pleuritic pain. Duration of discomfort varies from a few days to several months. The presence of a firm bulbous or fusiform swelling of one or more of the costosternal cartilages is essential in making the diagnosis of Tietze's syndrome. Tenderness may not be noted initially and is frequently one of the first findings to disappear. The swelling rapidly reaches maximal size and then either remains stationary or slowly regresses. Spontaneous regression rarely occurs before several months have elapsed, but complete recovery is the rule.

A review of the literature revealed 159 cases of Tietze's syndrome (only 7 in the American literature), but the authors feel that the condition is probably more frequent than the literature indicates. The second costal cartilage is most frequently involved. Tietze's original suggestions concerning the causal role of tuberculosis and malnutrition have not been confirmed. A sprain involving the ligaments and capsule of the costosternal joints after trauma, such as that from coughing, might well produce the picture of Tietze's syndrome. This would fit well with the natural history of the syndrome, as most sprains require 5 to 6 weeks to heal. Synovitis could also be a causative mechanism, either as the accompaniment of a sprain or secondary to an inflammatory process, but none of these explanations fully accounts for the clinical or anatomic findings, and the exact cause is unknown. Tietze's syndrome must be differentiated from other causes of thoracic pain, especially those involving the thoracic wall. Concern regarding heart disease or cancer often brings the patient for medical attention and must be carefully evaluated. There is no specific treatment for this syndrome. Symptomatic treatment, consisting of reassurance, local heat or counterirritants, and analgesics, suffices in many cases. Surgical excision of the lesion has been advocated by some, but the authors do not feel that this is warranted. In 5 of their 13 patients prompt relief of pain, together with reduction of swelling, was obtained with local injection of 20 to 37.5 mg. of hydrocortisone. The authors feel that this form of treatment is advisable in patients with considerable pain or in whom the swelling is bothersome.

Renal Affections Caused by Abuse of Phenaceti K. Larsen and C. E. Møller. Ugesk. læger 120:11 124 (Jan. 23) 1958 (In Danish) [Copenhagen].

Attention is directed to the connection betwee large phenacetin consumption and renal diseas Clinical observations and investigations are r ported which definitely testify to such a connectio Questioning of 698 patients, all over 20 years age, who were admitted to the medical departme of the Vejle District and Municipal Hospital durin a 6-month period in 1957, revealed that 337 di not take medicines containing phenacetin, 156 r ported occasional use, and 205 admitted dail consumption during at least a month. Twice many women as men took phenacetin daily; th women also took larger doses and for a long period of time. The renal function was reduced i 68 (33.2%) of the 205 patients who used phenaceti daily, in 17 (10.9%) of the 156 patients who use phenacetin periodically, and in 29 (8.6%) of the 33 patients who did not use phenacetin. The frequenc of reduced renal function increased with the siz of the dosage and the duration of use. Five case are described. Examination of 17 patients whos total consumption over a period of years amounte to 7 kg. (15.4 lb.) or more showed a uniform pictu of a renal lesion marked by reduced concentratio ability and reduced filtration. The hypothesis that the renal lesion depends on chronic hypox of the kidneys. The renal lesion caused by phenac tin and the acute tubulointerstitial nephritis (lowe nephron nephrosis) are regarded as the chroni and the acute form, respectively, of a disease du to oxygen deficiency in the kidneys. Employme of phenacetin in large doses often indicates gen uine drug addiction and may lead to grave ren disease. The authors recommend that preparation containing phenacetin should be available only o prescription.

SURGERY

Patent Ductus Arteriosus with Pulmonary Hypertension. H. B. Shumacker Jr. and P. R. Lurie. A. M. A. Arch. Surg. 76:179-192 (Feb.) 1958 [Chicago].

When patent ductus arteriosus is accompanied by pulmonary hypertension, diagnosis is more difficult, and surgical management is attended with special problems. In 1950 the authors abandoned the policy of treating patent ductus arteriosus by the multiple ligation-transfixion method and began to employ division and suture as the procedure of choice. The former method had yielded over-all good results but had not been free of disastrous consequences. With the method of division and suture, no fatality has been encountered in the treatment of uncomplicated patent ductus arteriosus and no recanalization has occurred. The ductus was divided in 31 patients who had pulmonary hypertension. In 13 of these the hypertension was mild or moderate, and in this group the ductus was found to be large or fairly large. All the patients save 1 withstood operative treatment without difficulty. This 2½-year-old child was quite ill and was on bed rest and digitalis therapy prior to operation. The operation was uneventful, but because of persistent atelectasis, which did not respond to nasotracheal catheter aspiration, the patient was subjected to bronchoscopy 2 days after operation. Cardiac arrest occurred, and resuscitation could not be achieved.

The 18 patients who had marked pulmonary hypertension included some in whom the pulmonary pressure was equal to the systemic. In some with nearly systemic pressures the shunt was all, or practically all, from left to right. In others it was evident that considerable reversal was taking place. Bidirectional shunt was established in several cases. The murmur was atypical in 12 of the 18 patients. Considerable general cardiac enlargement was noted roentgenologically in most of them, and the right ventricle seemed to be enlarged in the majority. All the patients had cardiac symptoms. A number were in heart failure and were being treated with digitalis. Others had retardation of physical development. Death resulted in 2 of the 18 patients. Thus, there were 3 deaths in the 31 patients (10%) in whom patent ductus arteriosus and pulmonary hypertension were not associated with other congenital malformations of the heart.

Observations are presented also on 7 patients with patent ductus arteriosus and coarctation definitely or presumably associated with pulmonary hypertension, and on 16 patients in whom patent ductus arteriosus was associated with intracardiac and other anomalies. All the patients with coarctation and patent ductus arteriosus survived. The mortality was disastrously high in those patients in whom patent ductus arteriosus was associated with intracardiac and other anomalies. It is felt, however, that careful study of such cases will bring about improvement in results and may yield information of value in the management of other cardiac conditions. It is becoming increasingly obvious that surgical treatment of a variety of abnormalities, such as ventricular septal defect and the more complicated atrial septal defect, is hampered principally by associated pulmonary hypertension and pulmonary arteriolar sclerosis of severe degree. While the physiological mechanisms, at least early in life, may be quite different in these various disorders, pulmonary hypertension and pulmonary vascular sclerosis are common to them all. What is learned about the management of pulmonary hypertension in patent ductus arteriosus may be helpful in the solution of other problems. It would seem wise to study carefully before operation all patients with patent ductus arteriosus, in whom pulmonary hypertension is suspected, by cardiac catheterization and selective angiocardiography, preferably cineangiography. Efforts should be made to determine the direction and degree of the shunt. Pressure measurements and electrocardiographic tracings should be obtained, and a lung tissue specimen for biopsy should be secured at the time of operation.

Experience with Permanent By-Pass Grafts in Treatment of Occlusive Arterial Disease. R. A. Deterling Jr. A. M. A. Arch. Surg. 76:247-260 (Feb.) 1958 [Chicago].

Because of discouraging clinical results in occlusive peripheral arterial disease with excisional therapy and end-to-end graft replacement, Deterling began in July, 1955, to employ bypass grafts in all patients operated on for acquired segmental occlusion of the major arteries of the lower extremities. More recently he extended their use to patients with occlusion of the thoracic and the abdominal aorta and with aneurysm of the thoracic aorta. He describes the surgical technique and then presents the results obtained with frozen homologous arterial grafts or with woven synthetic fabric grafts in 65 patients. The fact that the failure rate with the bypass homograft was only half that of excision and end-to-end graft in similar cases followed up for a comparable period of time is regarded as encouraging.

Clinical Use of Synthetic Arterial Substitutes in Three Hundred Seventeen Patients. E. S. Crawford, M. E. De Bakey and D. A. Cooley. A. M. A. Arch. Surg. 76:261-270 (Feb.) 1958 [Chicago].

Arterial homografts have been generally accepted as the most satisfactory arterial substitute, but their disadvantages are unavailability and inconvenience of preparation. Efforts have been directed more and more toward development of a suitable synthetic replacement. This report is concerned with an analysis of a 3-year experience with tubes made of Ivalon (polyvinyl formalinized) sponge, Orlon taffeta, knitted nylon-Dacron, knitted Orlon, crimped woven nylon, and knitted Dacron used to replace or bypass aortic and peripheral arterial lesions in 317 patients. Functional results of all replacements used in the thoracic aorta of patients who survived operation were satisfactory. Immediate results in lesions involving the abdominal aorta and common iliac arteries were also good in all patients but 1, but late failures occurred in 5 patients. Early failure occurred in the 5 patients in whom Ivalon tubes were used to bypass peripheral occlusions. Circulation was restored in only 1 of the 2 patients in whom inflexible knitted Orlon tubes were used to bypass peripheral occlusions.

but it was restored in all 3 patients in whom peripheral aneurysms were replaced by the Edwards-Tapp tube and in 92 of 105 patients in whom occlusive lesions were bypassed. The recently designed flexible knitted Dacron tube was used successfully in 2 patients to bypass occlusive lesions in the femoral artery and in 1 patient to replace a popliteal aneurysm.

Although the functional results in this series of patients have been generally good, certain disadvantages still must be overcome in creating an ideal arterial replacement. The porosity of synthetic materials causes excessive blood loss, and the lack of accessory branches for replacing segments from which essential major branches originate has been a limiting factor in some cases. Tubes made of Orlon taffeta coated with vinyl plastic are difficult to insert and are not adaptable to problems requiring even minimal flexibility. Ivalon tubes, although more flexible, are still too rigid for general use and in this series produced a relatively high failure rate of 35%. Knitted Orlon and knitted nylon-Dacron tubes, when used to replace localized segments not requiring flexibility, restore and maintain circulation and, within the limitation of their semirigidity, are satisfactory substitutes. The Edwards-Tapp tube is both flexible and adaptable, although its ends fray and insertion is sometimes difficult. The recently devised knitted Dacron tube incorporates the desirable characteristics of all other available substitutes, and with the addition of accessory branches a complete range of adaptability may be obtained. Preliminary results of its application, experimentally and clinically, indicates that it is the best substitute yet developed. An addendum states that the knitted Dacron tube has been used as a vascular replacement in 237 cases and has proved to be the most satisfactory vascular replacement available.

An Evaluation of Stripping Versus Ligation for Varicose Veins. K. A. Lofgren, A. P. Ribisi and T. T. Myers. A. M. A. Arch. Surg. 76:310-316 (Feb.) 1958 [Chicago].

At the Mayo Clinic, surgical treatment for varicose veins was direct dissection and partial extraluminal stripping from the beginning of this century to about 1927. Injection therapy alone then became the standard treatment during the next 10 years. In 1937 high ligation combined with retrograde injections became the accepted treatment. Complete stripping with a flexible intraluminal stripper having a larger acorn-shaped tip, which aided in telescoping of the vein, was started in 1947. The follow-up results from a group of 200 patients chosen at random for those who underwent high ligation and injection in 1940 were compared with those from a similar group of 200 patients who underwent complete stripping in 1950. The 1940 group was selected because in that year high ligation with retrograde injection was the treatment of choice. The 1950 group was selected because by that year complete stripping had become the accepted surgical treatment. Of 140 limbs examined 5 years or more after high ligation, 40% were classified as having excellent or good results, 5% fair results, and 55% poor results. Of 128 limbs examined 5 years or more after complete stripping, 94% were classified as having excellent or good results, 6% as having fair results, and none as having poor results. The incidence of recurrence requiring further surgical treatment was 36% for the limbs subjected to high ligation, whereas it was zero for the limbs subjected to complete stripping. Recanalization of injected superficial veins and the presence of persistent perforating veins were important factors in the high recurrence rate after high ligation. These results are convincing evidence of the superiority of complete stripping over high ligation in the surgical treatment of varicose veins.

Resection of Aneurysm of Thoracoabdominal Aorta: Involvement of Celiac and Superior Mesenteric Arteries, with Rupture into Psoas Muscle. E. S. Hurwitt, B. Seidenberg, S. C. Fell and D. S. Abelson. A. M. A. Arch. Surg. 76:239-246 (Feb.) 1958 [Chicago].

The authors present the history of a 53-year-old man in whom an aneurysm of the thoracoabdominal aorta was successfully resected. The aneurysm involved the celiac and superior mesenteric arteries and had ruptured into the psoas muscle. The bypass principle, applied by De Bakey to aneurysms in this location, was modified to achieve minimal periods of visceral ischemia by leaving the aneurysm in situ until most of the permanent anastomoses had been accomplished. The patient whose case is reported appears to be the 5th to have left a hospital well after removal and replacement of an aneurysm in this location, the 1st in whom the aneurysm had ruptured prior to operation, and the 1st in whom a protein-digested bovine heterograft was employed for the temporary bypass shunt.

The aneurysm in this man was dissecting a path into the psoas muscle, like a cold abscess, and his observation of something trickling down his spine during palpation of the aneurysm should have received more careful attention. The protein-digested bovine carotid artery employed for the temporary shunt functioned with complete satisfaction for 4 hours and 40 minutes before it was disconnected. The ready availability of this material and its qualities of ease of handling, nonleaking, and nonclotting make it ideal for this purpose. Whether or not this material will have a place in permanent arterial replacement is beyond the scope of this paper. Papain-digested equine arterial heterografts have been found wanting in permanent human application, with aneurysmal dilatation as the end-result.

Operative Treatment of Atresia of Esophagus: Results and Complications. T. T. C. Gertz and C. C. Winkel Smith. Danish M. Bull. 5:18-25 (Jan.) 1958 (In English) [Copenhagen].

Atresia of the esophagus occurs in several forms, the most common of which is that in which the upper segment of the esophagus is united by fistula with the trachea slightly above the bifurcation. The latter type, which is most amenable to operation, was present in 61 of the 67 infants with atresia of the esophagus who were admitted to the pediatric department of the Rigshospital from 1948 to the middle of 1957. Radical operation was performed on 52 patients, with 24 deaths; 3 of the survivors died later. The remaining 25 children are, by and large, developing normally. Since 1951 all operations have been transpleural through incision in the 4th or the 5th intercostal space, which the authors consider the method of choice. Diagnosis as soon as possible after birth is important, with transfer of the infant to a pediatric department and access to surgical treatment as soon as possible. Complications present before the operation include pulmonary complications and such malformations as malformations of the heart. Recurrence of esophageal fistula and leakages suggest that the operative technique may be improved, which is the only means of improving the result.

Suprahyoid Neck Dissection for Epidermoid Carcinoma of the Lower Lip: An Appraisal of Its Use in 130 Patients. A. Klippel and C. Eckert. Am. Surgeon 24:107-111 (Feb.) 1958 [Baltimore].

Suprahyoid neck dissection was performed on 130 patients with epidermoid carcinoma of the lower lip at the department of surgery of Washington University School of Medicine, in St. Louis, between 1934 and 1948. Of the 130 patients, 40 showed no clinical evidence of lymph node metastasis at the time of the neck dissection. In this group, the neck dissection may be classified as prophylactic. In 4 of the 40 patients, lymph node metastases were detected at the time of the pathological examination,-an incidence of 10%, which strikingly parallels the incidence of lymph node metastases in prophylactic neck dissections for cancer of the lip reported by other workers. Clinical evidence of lymph node metastases existed in the remaining 90 patients at the time of operation. In this group, pathological confirmation of the clinical impression was possible in 43 patients. In none of the patients whose primary lesion was controlled and in whom the lymph nodes were considered by the pathologist to be uninvolved was there evidence of cervical lymph node involvement in the course of the 5-year follow-up.

Operative deaths occurred in 2 (1.5%) of the 130 patients. In 10 patients the primary lesion was not controlled by the surgical intervention. Four patients were lost to follow-up. Three patients died of other causes in less than 5 years after the operation, but at the time of their deaths there was no evidence of cancer. In 15 patients persistence of the neoplasm in other portions of the neck was noted at some time after the suprahyoid neck dissection. Thirteen patients were cured, an absolute cure rate of 27.7%. When corrected for the patients in whom the primary lesion was not controlled, or in whom death occurred in less than 5 years with control of cancer up to the time of death, the cure rate was 38.2%. In 12 of the 15 patients with persistence of the neoplasm in the neck, the nodes immediately adjacent to the field of the suprahyoid operation were first observed to be involved. Suprahyoid neck dissection is, therefore, considered to be an unsatisfactory definitive procedure for lymph node metastases from epidermoid carcinoma of the lower lip.

The Intra-Osseous Vasculature of the Distal End of the Humerus with Special Reference to Capitulum. S. Haraldsson. Acta. orthop. scandinav. 27:81-93 (No. 2) 1957 (In English) [Copenhagen].

The author studied the topography of the intraosseous vascular system in the distal end of the humerus, particularly in the capitulum, on cadavers of persons ranging in age from 3 months to 75 years. A contrast medium consisting chiefly of white lead was injected into the vascular system, and on the basis of the observations the author arrived at the following conclusions: 1. As long as the nucleus of ossification of the capitulum of the humerus lies isolated in the epiphysial cartilage, it appears to receive its blood supply via a few vessels entering the cartilage from behind and forming intercommunicating vessels in the nucleus of ossification. At this stage of development the vessels of the nucleus (of ossification) are not in communication with the other parts of the distal end of the humerus. 2. The nucleus of ossification of the capitulum humeri extends in to the radial part of the epiphysial cartilage of the trochlea. Part of the trochlea is thus ossified from the ossification nucleus of the capitulum. 3. Vessels are seen to extend to the future site of the ossification nucleus (nuclei) of the trochlea before the bone salts deposited there have reached a concentration high enough to be demonstrable in the roentgenogram. 4. The topography of the vascular system forming in the capitulum during the period of ossification persists practically unchanged in the adult bone. 5. After ossification of the cartilage between the various nuclei of ossification of the epiphysis and of the epiphysial plate, the blood vessels of the diaphysis, metaphysis, and epiphysis intercommunicate.

The Painful Elbow: A New Approach. R. Meyer. Acta med. orient. 16:262-265 (Nov.-Dec.) 1957 (In English) [Jerusalem].

Patients with painful elbow, men and women of all age groups and occupations, complain of a dull pain in their forearm, especially during certain movements, such as using a screwdriver or lifting a load. When asked to indicate the spot where it hurts, they usually place the elbow in flexion of about 150 degrees, the forearm in pronation and the wrist in ulnar and volar flexion, and point to a site somewhere between the lateral epicondyle and the radial shaft. Some tenderness in the neighborhood of the lateral epicondyle, especially on the radial head, is usually present; passive movements are painful, although seldom restricted; signs of wasting and inflammation are absent. There has been no agreement on either the pathology or the treatment of painful elbow, but Bosworth in 1955 suggested a new type of operation which he came upon by chance. In 2 of his operations undesired accidents had occurred. The orbicular ligament (known also as the ligamentum annulare radii, forming part of the radial collateral ligament, consisting of circular fibers encircling the head of the radius and being inserted in the ulna on either side of the incisura radialis) was cut in operation. In the other the orbicular ligament, released from its attachment to the lateral epicondyle of the humerus, slipped down over the neck of the radius. However, the outcome of the operation was excellent in both patients. Prompt and lasting recovery was the result.

Resection of the orbicular ligament only, without division of the common head of the extensors, appealed to Meyer for the following reasons: 1. The operation releases a tight ligament which is under constant friction in pronation and supination. 2. It acts on the most tender spot. 3. Unlike the division of muscles, it does not weaken the power of dorsiflexion of the wrist needed in forceful closing of the fist. 4. It removes a ligament which is not essential in maintaining stability of the elbow. The author used Bosworth's procedure in 8 patients not responding to conservative treatment. In all of them the pain ceased, although the elbow remained sore for from 1 to 3 weeks. Two patients experienced a slight restriction of active movements, which subsided after 3 weeks without any treatment. The technique of the operation is simple. The author used it only when tenderness was most intense over the radial head. Patients more sensitive to pressure over the lateral epicondyle, as a rule, responded to conservative treatment.

NEUROLOGY & PSYCHIATRY

The Prevention of Chlorpromazine Jaundice. F. Dreyfuss, H. Klein and H. Z. Winnik. Acta. med. orient. 16:251-254 (Nov.-Dec.) 1957 (In English) [Jerusalem].

Liver damage resulting from the administration of chlorpromazine has occasionally played at least a contributory role in the death of a patient; it has led to unnecessary laparotomies and has at times led to premature termination of well-indicated chlorpromazine treatment. The evidence accumulated so far points to an intrahepatic, obstructive, cholestatic type of liver damage. Since bile thrombi are the predominant feature of the microscopic picture, the authors thought that increased viscosity of the bile might be a factor of etiological importance. They, therefore, attempted to prevent this type of hepatitis by increasing the fluid intake of patients undergoing chlorpromazine treatment. Starting in June, 1955, every patient undergoing chlorpromazine treatment was put on "fluid prophylaxis," that is, about 2.3 liters of sweetened tea or plain water were added to the patient's regular daily fluid intake. The patient usually received 200 mg. of chlorpromazine by injection or 300 mg. by mouth per day. Prior to the period of fluid prophylaxis, 16 cases of chlorpromazine jaundice had occurred among 363 patients undergoing chlorpromazine treatment (4.4%). Only 2 cases of jaundice occurred among the 688 patients treated with chlorpromazine and fluid prophylaxis from June, 1955, to June, 1957, inclusive. The rate of jaundice due to chlorpromazine administration is now less than 0.3%.

Use of Androstenediol in Therapeutic Neuropsychiatric Management. P. Dazzi. Minerva med. 48:4097-4099 (Dec. 5) 1957 (In Italian) [Turin, Italy].

The current knowledge about androstenediol, whose chemical formula is Δ^5-androstene-3β,17β-diole, is mostly of pharmaceutical nature. The androgenic, estrogenic, and progestational properties ascribed to this drug have led the author to use it in the treatment of a series of 39 women, between the ages of 38 and 62 years, with various disorders of the nervous or psychic systems. The patients were divided into 3 groups. The first group consisted of 16 women with pronounced psychic instability accompanying menopause. The symptoms persisted for several months and did not tend to subside. The patients complained of continual and severe headache, sudden flashes, gastrointestinal disturbances, and insomnia which was unmanageable with common sedatives. Androstenediol was given in weekly doses of 3 vials, each containing 25 mg. of the drug, during the first month; this dose was reduced to 2 vials during the second and third therapeutic months. The patients were kept under observation for a period of 4 to 8 months. Twelve patients have shown improvement of the objective symptoms. Subjective symptoms, such as lassitude, fatigability, and depression, have subsided more slowly, and required a second course of treatment in the case of 7 patients. The second group consisted of 14 patients in menopause, in whom the common symptoms of the transitional phase were associated with disturbances of the cenesthetic feeling. Psychic examination showed depression, accompanied by hypochondriacal attitude, which was refractory to all psychotherapeutic procedure. Only 8 patients in this group obtained an improvement of objective symptoms. The particular beneficial effect of the drug consisted in correcting the introvert attitude of the patients so as to make them more receptive to psychotherapeutic management. The third group of patients consisted of 9 women, with the type of depression called by Delay "minor." The patients complained of symptoms similar to those of anesthopathia: headache, vertigo, blurred vision, and lassitude. The main symptom was depression, which lasted for short periods of 15 to 20 days. Androstenediol therapy brought the humoral state to normal in 5 patients within 8 months. The remaining 4 patients obtained benefit only at the termination of therapy, which effect vanished within the next 15 days. The author recommends an individualized, rather than a nosographic, procedure in using androstenediol in the treatment of patients with nervous or psychic disorders.

Serological Epidemiology of Poliomyelitis in Central Scotland. R. C. MacLeod, L. G. MacGregor, H. E. Larminie and N. R. Grist. Scottish M. J. 3:76-81 (Feb.) 1958 (In English) [Glasgow].

Single serum specimens were examined for the presence of detectable antibody to the 3 types of poliomyelitis virus in a selected series of 450 children from different areas in central Scotland. It was found that in central Scotland a similar proportion of the children possess antibody to each of the 3 types. The incidence of antibody to all 3 types increases rapidly with increasing age. This finding is in keeping with the age distribution in cases diagnosed in this area, where some 60% occurred in the first 5 years of life and 75% before the age of 10. The similarity in the results obtained with each type of virus has indicated that they are equally prevalent. The paralytic disease appeared with increased prevalence in 1947, 1950, and 1955, but these episodes have not seemed to have left a distinctive mark upon the child population as measured by the age of development of type-specific antibody. Indeed, the similarity of the curves of antibody acquisition for each type and the gradual appearance of increasing immunity in the population surveyed as age advances indicate a widespread prevalence of virus. In children from the higher social levels, antibodies develop at a later age than in children of the lower social grades. The factors that produce this difference seem to be most effective in the early years of life. Analysis shows that this difference is not explained simply by family size and that, indeed, within the family there may be much variation in antibody type.

The State of Natural Antipoliomyelitis Immunity in Children Living in Closed Environments. G. C. Angela, G. Giuliani and W. Grillone. Minerva med. 49:252-256 (Jan. 24) 1958 (In Italian) [Turin, Italy].

Serum specimens were obtained from 148 children, between the ages of 6 months and 4½ years, living in 2 community centers for underprivileged children in Cuneo and Turin, so as to study the state of their natural antipoliomyelitis immunity. A surprisingly high incidence of antibody carriers for poliomyelitis virus was established. Among the 83 infants in the group 6 to 12 months old in Cuneo, 81.8% had antibodies for the virus type 1, and 45.4% for both types 2 and 3. The authors interpret the high incidence of natural immunity among the youngest infants as a result of a process of immunization related to a more intense outbreak of the epidemic of poliomyelitis which occurred in Cuneo at the time the infants were born. Since these children came from poor homes, they probably had been exposed to the influence of the virus during the epidemic and had thus acquired the natural immunity. The lower incidence of natural immunity among the older groups was probably due to the fact that these children had lived in the community centers for a while and had not been exposed to the virus which was rampant in the outside world. The incidence of natural antipoliomyelitis immunity in 65 children in the community center in Turin differed somewhat from that observed among the children in Cuneo; 33% presented no antibodies, 42.8% had antibodies for the virus type 1, 47.6% for type 2, and 57.1% for type 3. In the group 3 to 5 years, only 54.5% of the children had antibodies against all 3 types of poliomyelitis virus. The opinion of the authors is that life in a closed, selected environment impedes the acquirement of natural antipoliomyelitis immunity. The best protective measure for these children is the antipoliomyelitis vaccination.

Generalized Moniliasis with Localization in the Brain. J. Eschwege. A. M. A. Arch. Neurol. & Psychiat. 79:250-263 (March) 1958 [Chicago].

The author reports the case of a 21-year-old man who for 8 days before hospitalization had increasing headaches, joint and muscular pain, and temperature up to 39 C (102.2 F) and who was admitted to hospital with a diagnosis of poliomyelitis.

On admission he appeared slightly somnolent, and pronounced rigidity of the neck was present. Examination of the cerebrospinal fluid showed the following findings: 24 cells per 3 cu. mm., all mononuclears; protein, 41.8 mg. per 100 cc.; glucose, 72 mg. per 100 cc.; pressure, 165 mm. of water; and positive reactions to the Pandy and Nonne tests. The cerebrospinal fluid was at first clear and colorless but later became cloudy and xanthochromic. The patient was treated extensively with various antibiotics. Within 11 days he was given a total dose of 16 Gm. of chlortetracycline (Aureomycin) orally, which lowered the temperature to subfebrile values, but his condition deteriorated. Thereafter, treatment was continued with streptomycin, 19 Gm. administered intramuscularly and 150 mg. intrathecally, in combination with 14.5 Gm. of isoniazid administered orally and 6.4 Gm. intramuscularly because of a suspected tuberculous meningitis. The penicillin received by the patient totaled 11 million units given intramuscularly. Fifteen days after admission the patient was in coma, and a tracheotomy was performed because of superficial respiration and beginning cyanosis. Twenty-four days after admission the patient, previously constipated, discharged increasing amounts of liquid, often bloody stools, an indication of beginning ulcerative colitis. This was about 1 week after the administration of chlortetracycline was discontinued. More and more the patient began to present the picture of decerebrate rigidity. He died of circulatory failure after 1 month of hospitalization.

The exact nature of the underlying disease, with symptoms and signs referable to an inflammatory process affecting the meninges and the brain, for which the patient had been admitted to the hospital, could not be ascertained in life. All tests for tuberculous meningitis, including 3 animal experiments, gave negative results. The histological findings showed no evidence of a tuberculous process, the signs of which might have been suppressed by the streptomycin and isoniazid therapy. The bacteriological and viral examinations, as well as agglutination tests, including those for leptospirosis and toxoplasmosis, also were negative. Oral thrush was never found in the patient. The cerebral changes observed at autopsy were of 4 types: (1) metastases, characteristic of thrush (Candida albicans), all surrounded by glia-cell nodules of varying sizes, principally but not exclusively in the gray matter of the entire brain, with sites of predilection in the medulla oblongata and the basal ganglions, the thalamus, and the cortex of the temporal regions; (2) perivascular lymphocyte and plasma-cell infiltrations, not directly dependent on the nodules but more frequent in these nodule areas; (3) extensive areas of relatively increased and hypertrophied astrocytes and microglia cells in the gray, and more seldom in the white, substance, not directly correlated with the nodules; and (4) severe dementia-paralytica-like destruction and reaction centers in a closely circumscribed temporal region. These findings differ from those in the other so-called metastatic focal encephalitides of viral or bacterial origin in the larger size of the granulomas and the more extensive destruction of the nerve parenchyma in isolated areas of the cerebral cortex. Microscopically, a fungus identified as Candida was demonstrated in foci located in the peripheral musculature, the myocardium, the colon, the kidneys, and the brain. Macroscopically, there existed a severe ulcerative colitis. Every mycotic infiltration which ulcerates and comes in contact with the blood stream may lead to a hematogenous dissemination of the fungus, and there is little reason to doubt that the colon was the point of origin for the dissemination of the mycosis.

Since the broad-spectrum antibiotics have been generally employed, there has been a sharp rise of generalized moniliasis, especially of forms affecting the central nervous system, due to the destruction of the antagonistic intestinal flora which had inhibited the growth and proliferation of the fungus. The diagnosis of these forms of generalized fungus infection has been difficult, owing in part to inaccuracies inherent in the diagnostic methods and in part to the lack of familiarity of most physicians with these diseases, and also because of their clinical symptoms which fit other inflammatory diseases of the brain or meninges. Good antifungal agents, such as nystatin, are available and, when given in conjunction with broad-spectrum antibiotics, may do much to prevent or control a generalized Candida infection. Despite this, the prognosis of manifest generalized moniliasis remains grave. The indiscriminate use of antibiotics without the proper indications must, therefore, be avoided.

PEDIATRICS

Hyperadrenocorticism in Children, Due to Adrenocortical Adenoma: Study of a Case of Postoperative Cure Persistent After Six Years. R. Turpin, F. de Gaudart D'Allaines, R. Gorin and P. Thibault. Semaine hôp. Paris 34:210-220 (Jan. 24) 1958 (In French) [Paris].

The authors report the case of a 5-year-old girl with a hyperadrenocortical syndrome due to an adrenocortical adenoma. On admission to hospital the child had hirsutism, moderate obesity of the face and trunk, and considerable hypertrophy of the external sex organs, particularly the clitoris. She also had arterial hypertension and a relative slowing of body growth. There was increased excretion of 17-ketosteroids in the urine (4.9 mg. within 24 hours), while that of the 11-oxysteroids (formaldehydogenic steroids) was almost normal. Signs of hyperactivity of the pituitary gland and of the ovaries were absent. The retropneumoperioneal roentgenologic examination revealed an enlarged right adrenal gland; the left adrenal gland was normal. The child was operated on, and an adrenocortical adenoma with spongiocytic differentiation and relatively reduced lipid content was removed. The extirpation of this benign tumor was followed by the restoration of the arterial pressure to normal, and the obesity disappeared. Hirsutism was reduced, but an abnormal amount of pubic hair and hypertrophy of the clitoris and of the labia majora persisted. There was a pronounced acceleration of body growth, 14 cm. (5.5 in.) within 1 year after the operation. The excretion of hormones in the urine was restored to normal. The child was reexamined once more at the age of 10 years and 8 months. Beginning of the menstrual function had occurred a few days before this examination. The weight of the child was 38.5 kg. (85 lb.), and her height was 149 cm. (4 ft. 11 in.). There was axillary hair and the development of the breasts appeared to be normal for the age of puberty. The arterial pressure was normal (120/70 mm. Hg) and the general condition excellent. Her school record was good, although she was retarded by 1 year because of her previous disease. She was considered completely cured.

The adrenal origin of the syndrome in this patient is evident. Hyperadrenocorticism occurring before the age of 10 years in a previously normal child is almost always due to an adrenal tumor which is generally malignant. The benign tumor in the patient whose case is reported is an exception. In patients over 10 years of age the incidence of benign tumors increases. The excision of the tumor, which resulted in a complete cure in this case, made it possible to observe a gradual return to a normal endocrine balance and particularly to analyze some definite disturbances in body growth which were only of secondary interest before the operation. Hirsutism and hypertrophy of the clitoris were manifestations of a moderate hypersecretion of androgens, as confirmed by the increased excretion of 17-ketosteroids without increase in the β-fraction of these steroids. The hypersecretion of androgens should have had a stimulating effect on the body growth and the maturation of the bones, but since this was not the case, it must have been counterbalanced by an antagonistic hormone secretion. It is suggested that the adrenal glucocorticoids played the part of this antagonistic hormone, exercising a preponderantly inhibitory action on the patient's body growth by their catabolic or protein-antianabolic effect. This latter effect also favored an increased production of carbohydrates and their transformation into fats, which may explain the moderate but definite degree of obesity. The hypertension may have been attributable to the excess in mineral corticoids or may have depended on the hypersecretion of glycoprotein hormones. The occurrence of this viriligenic adrenal tumor in a female patient less than 10 years old is noteworthy.

Staphylococcus Pneumonia in Childhood. J. Kringelbach and J. Winge. Ugesk. læger **120**:143-150 (Jan. 30) 1958 (In Danish) [Copenhagen].

Staphylococcus pneumonia occurs most frequently during the first 3 months of life. The mortality is considerable. Two main types are described: (1) an acute fulminating type, often fatal after a few days, and (2) a more prolonged and less malignant form which does not react to sulfonamide preparations or penicillin. During the course of the latter type empyema or pneumothorax develops, possibly with tension or pyopneumothorax. Roentgenologic examinations show infiltrations, frequent atelectases, and pneumatocele formation. The diagnosis is suggested by the clinical course and may be verified by culture from the lungs or pleurae. Plasma-cell pneumonia is especially to be considered in differential diagnosis. Treatment consists in administration of tetracycline preparations, use of oxygen, and gastric aspiration; pleural complications are treated surgically. Among the 228 patients with pneumonia treated in the pediatric department of the Copenhagen County Hospital in Gentofte from 1955 to March, 1957, there were 13 cases of staphylococcus pneumonia or empyema, 11 of them in infants less than 1 year old. Of the 6 deaths in the entire series, 3 occurred in infants less than 4 months of age.

UROLOGY

A Physiological Approach to Bladder Irrigation in Gross Hematuria. J. U. Schlegel, H. Jørgensen, A. McFadden and W. W. Scott. J. Urol. **79**:224-229 (Feb.) 1958 [Baltimore].

Bleeding from the urinary tract can create a problem in management, since clot formation may block an indwelling catheter or even a normal urethra. Gross hematuria is quite common after prostatectomy, and it is a frequent postoperative procedure to use continuous or frequent bladder irrigation to maintain the patency of an indwelling catheter by diluting the blood sufficiently to avoid clotting. Such a procedure has several disadvantages. There is the danger of inducing an infection, accurate urine volume is hard to estimate due to the presence of a large amount of irrigation fluid, and frequent attendance to maintain the patency of the catheter is required. Many of these disadvantages could be overcome if a diuresis of sufficient volume could be established to maintain an internal irrigation. However, attempts to hydrate patients after surgery, as well as during conditions involving pain, hemorrhage, and emotional disturbances, will result in overhydration, with retention of fluids, due to antidiuresis. It is known that during antiduresis the urine volume is directly related to the amount of solutes excreted. Urea is a solute which apparently is utilized rather passively by the kidney and which will be distributed evenly over total body water, thus not causing any change in the compartmental distribution.

It had been shown by the authors that antidiuresis after surgery can be completely overcome by the administration of urea as a 4% solution. In this paper, they present a practical utilization of the basic physiological phenomenon of post-traumatic antidiuresis in 40 patients who had been subjected to prostatectomy. They found that in patients for whom 4% urea is added to infusion solutions of 5% dextrose in water, there is, in general, no change in the serum electrolytes, as compared with patients receiving approximately 2,000 cc. of intravenously administered fluids in the form of 5% dextrose in water and no urea added. This holds true even with fluid intakes as high as 4,000 cc. in the 24-hour period immediately after surgery. The administration of urea did not change the excretion of sodium. The authors conclude that the addition of 4% urea to the standard dextrose infusion makes possible the administration of large fluid volumes without the risk of water intoxication. The increased urinary output thus obtained appears to be a valuable aid in the management of patients after suprapubic prostatectomy. Recently the authors utilized the principles described in other cases of gross hematuria with equal success.

Dissolution Treatment of Vesical Calculi by Means of Automatic Irrigation Device. P. O. Hösli. Helvet. chir. acta 24:595-603 (Dec.) 1957 (In German) [Basel, Switzerland].

The author discusses the structure of urinary calculi and classifies them according to their composition, taking into account certain clinical factors. He suggests that in some cases an attempt can be made to dissolve the calculi. Vesical stones, especially the so-called struvit calculi, consisting chiefly of magnesium ammonium phosphate (or "triple phosphate") may be treated by continuous irrigation. Poor results of attempts at dissolving calculi have been due mostly to technical difficulties. It is not easy to comply with the demand for an uninterrupted, intensive, and prolonged contact between a constantly renewed irrigation fluid and the concrement. Intermittent irrigation with a syringe is inadequate, and even the use of a double-barreled catheter with continuous irrigation will generally fail, because the stone is not sufficiently surrounded by the dissolving fluid.

The author presents a diagram of an irrigating system constructed by him. It insures, with little supervision, an automatic intermittent flow, and the equipment required is available in any hospital. Several factors, such as the number of drops per minute, the elevation of the container for the irrigating fluid, the threshold, and the position of the discharge vessel, are variable and can be changed. Thus, the number of irrigations per hour may range from 3 to 20, and the amount of fluid per irrigation from 20 to 150 cc. The catheter must be of a large caliber in order to avoid leakage. The author presents the history of an 8-year-old girl in whom this method of irrigation was used successfully. Irrigation was carried out during the first phase with 3% boric acid solution and later with G solution, but the author believes that the choice of fluids was not decisive. Three to four irrigations were given per hour with from 30 to 40 cc. of fluid.

The Hospital Urine Bottle and Bedpan as **Reservoirs of Infection by Pseudomonas Pyocyanea.** J. W. McLeod. Lancet 1:394-397 (Feb. 22) 1958 [London].

There is evidence that endemic persistence of Pseudomonas pyocyanea on surgical wards may be responsible for much of the infection of this kind which often follows catheterization and operations on the urinary tract. Such infections have been reported in hospitals in many different parts of Britain. Certain wards, apparatus, and personnel of 3 hospitals in which Ps. pyocyanea infection had been observed were systematically examined. Similar investigations were also made, insofar as they were pertinent, in the laboratory in which the work was being done, to check the possibility that accidental laboratory contamination might be responsible for some of the observations made. In each of the 3 hospitals there was an outstanding type of Ps. pyocyanea strain differing from those in the 2 others, both in its reactions to agglutinating serums and in its bacteriophage sensitivity. It appears that infections with Ps. pyocyanea are largely hospital infections. This bacterium easily adapts itself to the human urinary tract, especially in the presence of protein exudate such as must inevitably be present after operations on the bladder. It is not a commensal organism of the normal external genitalia of the male and is not therefore unavoidably introduced in such procedures as catheterization. It does not readily persist in the dry state and is only found in dust exposed to recent heavy contamination.

The apparatus in normal ward use in which it can most readily persist is the urine bottle and the bedpan. Evidence was obtained that nurses and orderlies required to empty and rinse urine bottles and bedpans on urologic surgical wards will inevitably infect their hands repeatedly with Ps. pyocyanea. Hence, they are a source of danger to any patient whose bladder and drainage or lavage apparatus they have to manipulate. It seems probable that much of this infection could be avoided by a proper use of antiseptics. This would involve storing in an antiseptic tank all urine bottles and bedpans not in use and issuing bottles for use only from such tanks. If there was in each bottle a residuum of antiseptic solution—about a fifth of the capacity of the bottle, it would be sufficient to sterilize the bacteria excreted by the patient even when diluted fourfold by urine.

The sterilization of the feces by residual antiseptic in the bedpan is more difficult, but the danger of infection from this vessel could be largely eliminated if 2 procedures were regularly followed. The first of these would be sterilization of the bedpan, after cleansing, by a brief immersion in boiling water or a longer one in an antiseptic bath. The second would be that the nurse or the orderly handling bedpans should do so only when wearing rubber gloves; if the gloves, while still on the hands, were cleansed under running water and then rinsed with alcohol or, better, an antiseptic solution before they were removed, the contamination of hands would be reduced to a minimum. Complete destruction of bacteria, such as Proteus organisms and Ps. pyocyanea, in a few minutes is not easily attained with any antiseptic. Elimination of infection in all vessels used for the collection of excreta should be assured by an efficient use of antiseptics, as described above. While some antiseptics are not bactericidal for Ps. pyocyanea, phenol (carbolic acid) in a 2% solution is adequate and cheap.

OPHTHALMOLOGY

Clinical and Etiologic Evaluation of an Epidemic of Keratoconjunctivitis. A. Kahán and I. Béládi. Ophthalmologica 135:79-87 (Feb.) 1958 (In English) [Basel, Switzerland].

An epidemic of keratoconjunctivitis involved 234 patients who were treated at the clinic of ophthalmology of the medical school of the University of Szeged, Hungary, between 1954 and 1956. In the beginning of the epidemic, clinical manifestations consisted of multiple, grayish, subepithelial lesions of the cornea, sometimes associated with a central epithelial defect and accompanied by mild conjunctivitis but without adenopathy or any general symptoms; in some patients, these foci were located near the limbus, with engorged vessels and even with the appearance of a small pannus. Most of the patients were middle-aged, being 35.3 years old on the average. From April, 1956, onward there was a change in the clinical aspect, and a conjunctivitis, characterized by many petechiae near the lid margin and associated with pharyngitis and general symptoms, predominated. The patients were young people and children, the average age being 24.4 years. In this aspect of the disease the cornea was involved only in adults, but the disease was associated with simultaneous herpes eruptions in children. From 2 patients with conjunctivitis, virus strains were isolated on HeLa-cell cultures; these were identified as type 3 of the adenovirus group, and specific neutralizing antibodies were found in the patients' serums. The epidemic culminated in August-September, 1956; a chlorinated swimming pool was suspected as chiefly contributing to the spreading of the disease. Jawetz' hypothesis that the cases of conjunctivitis occurring in the outbreaks would be caused by an adenovirus and that involvement of the cornea would occur only in patients with coexistent herpes infection is supported by some of the data reported by the authors.

Septic Retinitis Due to Candida Albicans. J. M. Van Buren. A. M. A. Arch. Path. 65:137-146 (Feb.) 1958 [Chicago].

Mycotic infection of the eye by any route is rather rare, but there have been instances of conjunctival infection with Candida albicans. The present case was considered of interest because in a patient with a blood-stream infection with C. albicans a small retinal lesion resembling a Roth spot appeared; at postmortem examination this lesion was found to contain the hyphal elements of the yeast. The increase in recent years in recorded instances of systemic moniliasis suggests that further examples will come to light. The patient presented was a 53-year-old woman, in whom a diagnosis of multiple myeloma had been established 12 months previously. A retinal lesion was noted several months after C. albicans had been cultured from the vagina and the patient had had a mild but prolonged attack of enteritis. There was also a history of recent head injury, and for an attack of pneumonitis the patient had been treated with penicillin and streptomycin. Later C. albicans was cultured from the urine, the blood, the throat, and the bone marrow. The retinal lesion at this time lay above the disk, about a disk diameter from its margin, and consisted of a rounded hemorrhagic area, the center of which was white. The lesion was apparently uninfluenced by the pattern of the nerve-fiber layer and was not in relationship to a blood vessel. In the next few days there was enlargement by inferior and lateral extension. It was suggested that this might be a local C. albicans colony in the retina. Therapy with nystatin (Mycostatin) was cautiously attempted, but the patient proved intolerant to the medication. The patient's subsequent course was complicated by femoral thrombophlebitis and continued pneumonitis. Death preceded by an acute substernal pain occurred a month after the discovery of the retinal lesion.

Microscopic studies on the eyes during the postmortem examination indicated that the major retinal lesion had evidently taken origin in the nerve-fiber layer, and hyphal and budding forms of the yeast were demonstrated in one lesion. An additional type of retinal lesion was seen in which there was little, if any, evidence of inflammatory reaction. Two types of retinal lesions have been found, both in the present case and in previous cases of bacillary septicemia and embolism. Both types of lesions arise in the nerve-fiber layer, but the reason for the apparently exclusive origin in the nerve-fiber layer is not clear. One type of lesion is frankly inflammatory and seems adequately explained as a result of a septic embolus. The second type, perhaps more properly termed a Roth spot, is a more localized lesion, the response to which is predominantly noninflammatory. Difficulties are pointed out in accepting the latter lesion as being due to embolism, infarction, or varicose axonal degeneration of the retinal ganglion cells.

OTOLARYNGOLOGY

Deafness Following Mumps. G. Everberg. Acta oto-laryng. 48:397-403 (Nov.-Dec.) 1957 (In English) [Stockholm].

The author reports on 112 children and adolescents, with total deafness in one ear and clinically normal hearing in the other, who were studied at the ear clinic of the City Hospital in Copenhagen. Sixty-five of these patients had a history of mumps. In 44 the mumps had occurred before the deafness was recognized, but in only 5 could the deafness be reasonably attributed to mumps. These 5 cases of deafness due to mumps were detected among a population of 185,000 examined over a period of 10 years. Within the same period and within the same area, no case of bilateral deafness was found after mumps. Half of this population had a history of mumps, and, therefore, the frequency of deafness as a complication to mumps may be estimated to be about 0.05 per thousand. A review of the literature has revealed that 80% of all cases of deafness due to mumps may be estimated to be unilateral.

Malignant Melanoma in Rhinopharynx and Nasal Cavity. B. W. Walther. Nord. med. 59:145-147 (Jan. 23) 1958 (In Danish) [Stockholm].

Malignant melanoma in the rhinopharynx and the nasal cavity has not often been described in Scandinavian literature. The diagnosis, while simple, is frequently not made primarily. Usually evulsion of nasal polypi is done several times without suspicion of malignancy. On pathanatomic examination because of rapid recurrence, sometimes with black-colored tumor masses, nosebleed, headache, and metastases, malignant melanoma is diagnosed. Most authors recommend routine pathanatomic diagnosis of all nasal polypi. Urine reaction to melanogen does not, as a rule, become positi[illegible] until there are large tumor masses and extensive metastases. As radical an excision as possible regardless of postoperative cosmetic defects, with electrocoagulation as supportive technical help, is the only form of therapy which, applied at an early stage, offers the possibility of recovery. Radiotherapy and radioactive substances are only palliative. The prognosis is poor; about 5% of the patients are expected to survive from 2 to 5 years. However, with today's improved technique and radical excision at an early stage, improvement in the prognosis may be looked for. The personal case reported was that of a farmer, aged 60 years, who had been treated several times from 1947 on for chronic hypertrophic rhinitis, deviation of the septum, and rapidly recurring nasal polypi. Pathanatomic diagnosis of malignant melanoma was made in 1948. The melanoma was treated by electrocoagulation and excision. The patient's condition remained remarkably good except for repeated local recurrences that were treated by palliative electrocoagulation. Operation for acute ileus in 1953 revealed invagination of the small intestine due to metastasis from the rhinopharynx melanoma. A year later metastasis to the liver was palpated. After the establishment of the malignant melanoma, the patient lived more than 6 years and continued to do light farm work until a few months before his death. He lived 15 months after the first sign of distant metastasis.

584 Foreign Bodies Removed from the Esophagus: A Statistical Study. E. S. Ray and P. P. Vinson. Virginia M. Month. 85:61-64 (Feb.) 1958 [Richmond].

In the course of 20 years the authors directed the treatment of 933 patients who had foreign bodies in the air or food passages. This report is concerned with the 584 in whom the foreign body was in the esophagus. Contrary to the general belief, foreign bodies are found in the esophagus more frequently in adults than in children. Of the patients whose records were reviewed, 269 were under 10 years of age, while 315 were 10 years of age or older. The youngest patient was 2 months old, and the oldest was 94 years. The absence of teeth is a major factor in the impaction of a foreign body in the esophagus. In adults inadequate mastication and the loss of sensation in the mouth that results from artificial dentures is responsible for bones and meat sticking in the esophagus. Dentists should warn all patients, when they are provided with partial or complete dentures, of this hazard and should explain that care should be taken in the preparation and mastication of food. This applies particularly to chops, hash, and especially to chicken served à la king, in a salad, and in a pie. The auth[illegible]s also take issue with dentists who econ[illegible]vable dentures, complete or partial, be left in a patient's mouth during sleep. Several of the patients swallowed dentures while they were asleep.

Foreign bodies most frequently lodge in the upper third of the esophagus. Painful deglutition and obstruction to passage of food through the esophagus are the most frequent symptoms. The majority of foreign bodies are not revealed by roentgenoscopy, and diagnosis must be made from history and esophagoscopy. When a foreign body that is nonopaque to x-rays is suspected in the esophagus, barium should not be used as a contrast medium in localization, but iodized oil may be employed. Esophagoscopic examination should be made without delay. General anesthesia increases the comfort and safety of instrumentation. Preexisting lesions in the esophagus are frequently responsible for lodgment of a foreign body, especially in the lower third of the organ. Whenever a foreign body is encountered in this location, the esophagus should be thoroughly examined after removal. Impaction of a foreign body, especially a bolus of meat, at the site of a previously existing stricture may further compromise an already reduced blood supply and may result in necrosis and rupture of the wall of the esophagus. Dilation of a stricture should be deferred for at least a month after removal of a foreign body to permit healing of ulceration and reestablishment of circulation. A foreign body that passes through the esophagus will usually continue through the gastrointestinal tract and be expelled spontaneously. Occasionally passage through the stomach is delayed, but surgical removal is seldom necessary.

Bronchoscopy in Hemoptysis. F. O. Segarra. New England J. Med. 258:167-170 (Jan. 23) 1958 [Boston].

The correlation between hemoptysis, roentgenologic picture, and bronchoscopy was studied in 675 patients presenting hemoptysis and abnormal chest films. With the aid of bronchoscopy, the lesion responsible for hemoptysis was discovered in 498 cases (73%). Among the patients with a positive bronchoscopic diagnosis, bronchial cancer was present in 39%, bronchitis in 25%, and endobronchial lesions produced by peribronchial lymph-node calcification in 15%. There is no characteristic roentgenologic picture to give one an indication of the bronchopulmonary disease responsible for the hemoptysis, with the exception of the peribronchial lymph-node calcification and the pulmonary retractions, in which bronchoscopy reaches the highest figures of positivity. Formerly, when the x-ray study failed to give an answer, the problem could be explained by the assumption of the existence of bleeding in the larynx or the pharynx. The present study shows that this view is no longer tenable. The usefulness of the bronchoscopic method stands out clearly if one considers that in 73% of all the cases of hemoptysis, regardless of whether or not they were associated with roentgenologic abnormalities, it was possible to localize the bleeding point in the bronchi. The routine performance of bronchoscopy in patients who have expectorated blood is advised regardless of the results of roentgenologic examination.

THERAPEUTICS

Arterial Embolism Occurring During Systemic Heparin Therapy. R. E. Weismann and R. W. Tobin. A. M. A. Arch. Surg. 76:219-227 (Feb.) 1958 [Chicago].

Heparin is considered to be a valuable and effective anticoagulant agent. During recent years, concomitant with a more aggressive medical and surgical management of the various vascular disorders, the authors observed and treated a number of patients who suffered major arterial embolism while receiving heparin. The increasing frequency of this complication induced them to study this phenomenon. They present 10 patients in whom 1 or more emboli occurred during the systemic administration of therapeutic doses of heparin. In some patients the embolization nullified an apparently satisfactory result of the initial medical or surgical treatment. Embolectomy was performed in all patients. Clinical and autopsy studies suggested that all patients had occult friable aortic thrombi, in various states of unstable organization, which were not suspected or recognized prior to the sudden dramatic peripheral occlusion. The embolizations observed in these 10 patients were from the aortic wall and were precipitated by some unknown local effect of systemic heparinization. The gross and microscopic characteristics of the emboli collected at operation were the same in all cases in this group. Arterial embolism must be considered a possible complication of vigorous heparin therapy in those persons with preexisting aortic thrombi.

Acetazolamide in the Treatment of Chronic Cor Pulmonale. P. Longo. Minerva med. 49:84-91 (Jan. 13) 1958 (In Italian) [Turin, Italy].

Sixteen hospitalized male patients with cor pulmonale received acetazolamide therapy, supplemented by the administration of nicotinic acid, antibiotics, and digitalis or strophanthus. The bronchopulmonary disorders were mostly of emphysematous and, in some instances, of sclerotic or pneumoconiotic types. At admission the patients had cyanosis, hepatomegaly, distended neck veins, and edema. Acetazolamide was given in the form of tablets in daily dosage of 500 mg. divided into 2 equal doses during the first 3 days; the dosage was reduced by one-half during the succeeding 5 to 10 days. After a short drug-free period, the therapy was resumed in daily dosage of 250 mg.

or strong, and an assessment is made by examining 400 consecutive neutrophil polymorphonuclear leukocytes. The percentage of cells with phosphatase activity was ascertained in 50 healthy persons, 50 patients with chronic myeloid leukemia, 50 patients with polycythemia vera, and 17 patients with leukemoid reactions. It was found that in chronic myeloid leukemia and acute neutrophil leukemia the alkaline phosphatase activity is reduced or absent.

In leukemoid reactions due to Hodgkin's disease, myelofibrosis, reticulosarcoma, carcinomatosis, polycythemia vera, hemolytic anemia, and tuberculosis, high levels of alkaline phosphatase were found in the leukocytes. The amount of alkaline phosphatase in the leukocytes appears to be regulated by the pituitary-adrenal axis. In complete remission in 2 cases of acute lymphatic leukemia that followed cortisone therapy, in spite of the apparent normality of the white blood cells, the phosphatase levels were high and remained so until the leukemia relapsed. The determination of alkaline phosphatase in the leukocytes is at present the best, and often the only, means of distinguishing between myeloid leukemia and leukemoid reactions involving the myeloid series of cells.

Malignant Testicular Tumours Following Mumps Orchitis. J. C. Giertsen. Acta path. et microbiol. scandinav. 42:7-14 (No. 1) 1958 (In English) [Copenhagen].

In the case of 120 patients with malignant tumors of the testes, who were operated on at the University Hospital in Bergen, Norway, the surgical specimens were studied in the department of pathology, and in 5 of these patients a preceding mumps orchitis was revealed by the clinical records, representing an incidence of 4%. In addition, there was a 6th patient, a 51-year-old man, with a malignant tumor of the right testis after mumps orchitis, who had been operated on at another hospital and whose surgical specimen was referred to the author for pathological examination. These 6 patients were between the ages of 18 and 51 years at the time of the mumps orchitis, and the interval between the mumps orchitis and the clinical appearance of the tumor varied from 8 to 26 months, except for 1 patient in whom this interval was 20 years. The right testis or both testes were affected by the mumps orchitis; the tumor occurred in the right testis, except for the patient with the long interval between the mumps orchitis and the occurrence of the tumor, in whom the left testis was involved by the tumor. The type of tumor was embryonal carcinoma in 1 patient, seminoma in 3 patients, and chorioepithelioma in 2 patients.

The average interval of 19 months between mumps orchitis and the clinical appearance of the tumor in 5 of the 6 patients was strikingly short and compatible with a causal relationship between the 2 diseases. The facts that the tumor occurred in the same testis which was affected by the orchitis in 1 patient, that there was bilateral orchitis in 4 patients suggesting severe damage to the testes, and that in 1 patient the tumor occurred in the testis that was most severely damaged by the orchitis justify the discussion of a possible causal relationship between mumps orchitis and the occurrence of the tumor in these 5 patients. A direct relationship between the 2 diseases is less convincing only in the patient with the 20-year interval between the mumps orchitis and the occurrence of the tumor in the contralateral testis. It is well known that atrophic testes may become involved more frequently by a tumor than normal testes. A hormonal influence or disturbance is necessary for the experimental production of testicular tumors. Postorchitic atrophy with hormonal imbalance must, therefore, be regarded as a possible tumor-inducing factor, and it appears possible that mumps orchitis may have a tumor-inducing effect.

RADIOLOGY

Roentgen Manifestations of Torulosis (Cryptococcosis). J. N. Wolfe and G. Jacobson. Am. J. Roentgenol. 79:216-227 (Feb.) 1957 [Springfield, Ill.].

Torula histolytica (Cryptococcus neoformans) is a fungus of world-wide distribution. It is usually a saprophyte, but as a pathogen it is more frequent than commonly supposed, as indicated by the cases of 21 patients seen at the Los Angeles County Hospital between 1945 and 1956. Seven of the 21 cases analyzed in this paper are described in detail. The epidemiology, mycology, and pathology of torulosis are reviewed briefly. There are no characteristic clinical features of the disease, and the diagnosis can be made only by recovery of the organism. The disease may be rapidly fatal or exist for periods of 12 to 15 years. Nine patients had pulmonary lesions which were nonspecific in appearance, ranging from segmental infiltrations to discrete mass lesions indistinguishable from primary or metastatic neoplasms. Both cavitation and mediastinal lymphadenopathy may be present. There were 3 patients with osseous lesions, consisting of a limited area of bone destruction with slight periosteal reaction. Six of the patients are living, 3 without evidence of disease. Pulmonary resection was performed in 2 of these 3 patients, and a bone lesion was curetted in the third.

Metastatic Lesions to the Large Intestine. R. Wigh and N. duV. Tapley. Radiology 70:222-229 (Feb.) 1958 [Syracuse, N. Y.].

The authors report roentgenologic findings in 7 men and 23 women, between 32 and 85 years of age, with metastatic lesions affecting the colon. All the lesions were intra-abdominal or pelvic in origin, except for those in 2 patients who had lesions secondary to cancer of the breast and 1 patient who had a lesion secondary to squamous-cell carcinoma of the leg. Two patients had had a primary malignant neoplasm of the large intestine, but the history and the surgical and pathological findings indicated that the newly discovered lesions were not additional primary carcinomas but were truly metastatic in type.

Eleven of the 30 patients had at least 2 defects shown by the roentgenograms, and 5 of these had 3 or more defects. Although primary carcinoma of the large intestine can be multicentric, this is not true of as high a percentage of patients as in the authors' study. There were 17 patients in whom the lesions were of annular type but in whom the typical shelving aspect of primary carcinoma was absent. Instead of presenting an abrupt transition between normal and affected intestinal wall, the extremities of the defects were tapered or conical. There was incomplete distensibility of the intestine, but contractility still remained. The roentgenoscopist frequently reported the presence of "spasm" or "irritability" in these areas. In areas of narrowing, both concentric and eccentric shadows were seen. Unilateral defects were noted in 11 patients. Marginal serrations in unilateral defects were noted in 6 patients and were interpreted as a neurogenic response to the presence of a contiguous mass in the mesentery.

The term "encapsulation" was coined for abnormalities consisting of trapping or enclosure of large portions of the colon in a sheath not normal to the part. In other patients, the contours of the intestine were of a lobulated character. There were only 2 patients with complete obstruction, but partial obstruction to the retrograde flow of the barium mixture was observed in 9 patients. Abnormal fixation in position of segments of the colon as a result of extrinsic pressure was observed in 15 patients; angular distortion or kinking proximally was found only occasionally. Assessments of the appearance of the mucosa were not easy. There were patients in whom the folds were obviously not destroyed at least in the tapered extremities of the deformity, and there were others with obvious abnormality of the mucosa, but the alterations were considered insufficient, in relation to the length of the area of involvement, to represent primary carcinoma. These roentgenologic features of patients in whom metastatic carcinoma affected the large intestine permit the conclusion that the roentgenologist can offer such a diagnosis with a high degree of confidence.

Roentgen Diagnosis of Pericardial Effusion: New Angiocardiographic Observations. I. Steinberg, H. V. von Gal and N. Finby. Am. J. Roentgenol. 79:321-332 (Feb.) 1958 [Springfield, Ill.].

Thirty patients with pericardial effusion, studied by angiocardiography, form the basis of this report. They represent a selected series, because angiocardiography was utilized only in those patients in whom pericardial fluid was not clearly recognized and the differential diagnoses had to consider a dilated or an enlarged heart, a mediastinal tumor, or a pericardial tumor. In every instance, the characteristic feature of pericardial effusion, a heart surrounded by fluid, was demonstrated in frontal view. In the lateral projection, however, the pericardial fluid was always anterior, retrosternal, and infracardiac, causing backward displacement of the heart. It seems that small amounts of pericardial fluid first accumulate below the heart. The fluid extends anteriorly and then appears along the lateral borders of the heart with consequent "straightening." When massive pericardial effusions occur, the lateral pericardial recesses behave very much like water wings and extend laterally. These lateral pouches may fill asymmetrically, simulating pericardial or mediastinal masses. It is recommended that the anterior or infracardiac approach be used for pericardial paracentesis so as to avoid traversing the lung. Angiocardiography is recommended for diagnosis of pericardial effusions in problem cases. This method is preferred to diagnostic pericardial paracentesis, because enlarged and dilated hearts are easily lacerated. The increasing use of surgery for treatment and biopsy of the pericardium in pericardial effusions also makes preoperative diagnosis imperative.

BIOCHEMISTRY

Studies of One-Carbon Metabolism in Man. L. D. Goodwin and J. M. Kinney. J. Biol. Chem. 230:487-496 (Jan.) 1958 [Baltimore].

In an attempt to compare the fate of preformed methyl groups with the fate of a compound chemically similar, and metabolically closely related, to 1-carbon intermediates, 2 men, 1 of whom was 70 years old with osteosarcoma and the other 69 years old with thyroid carcinoma, were given 200 μc of L-methionine-$C^{14}H_3$ (256 and 211 mg. of amino acid), and a third patient, a 41-year-old man with lipomatosis, was given 200 μc of sodium formate-C^{14} (13 mg.). The 3 patients were hospitalized in the metabolic ward of the James Ewing Hospital unit of Memorial Center in New York; they were in good general condition, ambulatory, and were receiving the regular hospital diet. After ingestion of the labeled compounds, the isotope appeared rapidly in respiratory carbon dioxide and urea, in uric acid and creatinine, and in the amino acids of plasma protein. Amino acids were isolated by ion exchange chromatography from total protein samples, and creatinine was obtained from serial urines. Of the 17 amino acids isolated, methionine, serine, cystine, alanine, glutamic and aspartic acids, glycine, and arginine displayed significant radioactivity. The interrelations represented by these and other compounds examined, involving 1-carbon and amino acid metabolism, have been discussed; in general, the pathways indicated in man are consistent with those already established in mammalian studies. Evidence is presented for the occurrence of methyl synthesis in man. The 1-carbon intermediates derived from methionine and formate are readily incorporated into serine. The labeling of creatinine provides further evidence of transmethylation as a physiological process in man.

Respiration of Human Skin: Normal Values, Pathological Changes and Effect of Certain Agents on Oxygen Uptake. E. Leibsohn, B. Appel, W. C. Ullrick and M. J. Tye. J. Invest. Dermat. 30:1-8 (Jan.) 1958 [Baltimore].

The aim of the studies described was to establish the mean energy requirements of human skin, indirectly, as measured by the oxygen absorption. The requirements of the epidermis were differentiated from those of the whole skin, and these values were related to the energy requirements of other organs of the body and of the body as a whole. Biopsy specimens of human skin, taken without the patients being under anesthesia, from about 7.5 cm. below the shoulder, on the lateral aspect of the arm of individuals of varying age, sex, and race, were used in the study for normal values. Pathological skin specimens were obtained from patients at the site of active lesions. Warburg's technique was used for the respiratory measurements. The studies involved mechanical separation of the epidermis from most of the dermis and calculating the respiration of the pure epidermis. In 22 biopsy specimens of normal skin, the mean Qo_2 (rate of oxygen consumption in microliters per hour per milligram of tissue) for the dermis was 0.49 ± 0.12. The calculated Qo_2 in 16 specimens for the pure epidermis was 4.53 ± 1.39. The epidermal-dermal difference was highly significant statistically. It was estimated that the skin requires 7% of the normal, resting, total body oxygen consumption: 4% for the epidermis, 3% for the dermis. In terms of heat production this represents 2.04 and 2.64 calories per hour for the dermis and the epidermis, respectively, or 4.68 calories per hour for the skin as a whole.

The data obtained show that a large degree of variation exists among the individual values for dermal and epidermal respiratory rates and is evidenced in the rather large standard errors. This in itself may prove to be of interest. Part of the large variability in the data is probably due to the fact that human material is much more heterogenous than is animal tissue. The age, sex, race, etc., of the individuals from whom the biopsy specimens were taken may contribute to the scatter in the results. In spite of the large variation in the individual results, the respiration of epidermis is higher statistically than the respiration of dermis. This is understandable; one would expect the epidermis to be more active metabolically than the dermis because of its functions of cell division and growth. No general statement can be made on the pathological skin specimens, because the studies are still in the preliminary stage.

Utilization by the Human Organism of Peptides of Bovine Blood Protein Hydrolyzate. K. Raczyńska-Bojanowska and I. Chmielewska. Bull. Acad. polon. Sc. 6:1-6 (No. 1) 1958 (In English) [Warsaw, Poland].

Fifteen patients who had been operated on for gastric ulcers and 3 healthy persons were studied in an attempt to ascertain which bovine blood protein hydrolyzate, the one with a large or the one with a small peptide content, when intravenously administered, is more valuable for the human organism. Preparations of varying peptide content were obtained as a result of different conditions of proteolysis. The peptide amino nitrogen content varied from 15 to 41% of total amino nitrogen, i. e., from 0.8 to 2.3 Gm. of amino nitrogen bound in peptide bonds per 1,000 cc. of 7% hydrolyzate. Seven of the 15 patients operated on for gastric ulcer received the usual light hospital diet and 3,500 to 10,500 cc. of the hydrolyzate administered intravenously after the operation; the other 8 patients did not receive the hydrolyzate after the operation. The 3 healthy persons received a full caloric nonnitrogen carbohydrate and fat diet and, in addition, 1 liter of the hydrolyzate administered intravenously.

Determinations of amino nitrogen in free and bound amino acids excreted in the urine by the patients with gastric ulcers before and after the operation showed that the operation alone increased the excretion of amino nitrogen of free and bound amino acids from 1½ to 6 times, the increase being greater in the case of bound amino acids. The administration of the hydrolyzate increased further the amount of both free and bound excreted amino acids. There was, however, neither proportionality nor positive relationship between the amount of bound amino acids given in the hydrolyzate and those excreted in the urine by the patients operated on. The amount of excreted amino nitrogen of bound amino acids is more or less the same and depends neither on the amount administered nor on the type of the hydrolyzate. Thus, a great part of peptides given in the hydrolyzate of high-peptide content are metabolized by the human organism. It follows then that the hydrolyzate of high-peptide content is at least as valuable as the hydrolyzate of low-peptide content. The results obtained in the healthy persons were in agreement with those obtained in the patients in proving that a considerable part of the hydrolyzate peptides is metabolized by the human organism.

BOOK REVIEWS

Office Gastroenterology. By Albert F. R. Andresen, M.D., Attending Physician, Long Island College Hospital, Brooklyn. Cloth. $14. Pp. 707, with 110 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

This monograph, based on the personal experience of the author, should be of primary interest and value to the general practitioner and internist. Although the material is well organized and covers the specialty, depth is occasionally sacrificed for brevity and perspective is occasionally distorted in an attempt to present personal views with sincerity and integrity. An example is the author's emphasis that allergy is largely responsible for the exceedingly variable gastrointestinal symptoms, so often more conventionally attributed to functional gastrointestinal disorders. Another example is the author's belief in the value of the eradication of foci of infection in the prevention and relief of peptic ulcers. The first section consists of a plan of attack on gastrointestinal disease. This deals with the fundamentals of history taking, physical examination, and general physiology as a springboard for treatment. Other sections deal with the various diseases of the gastrointestinal tract, their symptoms, diagnosis, and treatment. Especially in this section, the scarcity of good illustrations and the singular approach to therapy are most obvious. The interdependence of gastrointestinal symptoms with those of the cardiorespiratory and genitourinary systems is included. The treatment of diseases of the hepatic and biliary systems is adequate. The material is up to date and timely and includes words of caution on evaluating anticholinergics, corticosteroids, tranquilizers, and antibiotics. The author has presented physicians of all interests with a highly readable and inclusive book on gastroenterology. Although his work has confessed limitations, it represents the experience of one who is highly respected in this field.

The Medical World of the Eighteenth Century. By Lester S. King, M.D. Cloth. $5.75. Pp. 346, with illustrations. University of Chicago Press, 5750 Ellis Ave., Chicago 37; Cambridge University Press, Bentley House, 200 Euston Rd., London, N. W. 1, England; University of Toronto Press, Toronto 5, Canada, 1958.

A book on any phase of the history of medicine is likely to be doubly interesting, because there is intrinsic fascination in the doings of humanity in the past and because the reader might thereby be enabled to spare himself a repetition of old mistakes. Focused on the medicine of the 1700's, this book gives some startling descriptions of life in an age when physicians had no thermometers, their watches had no second hands, surgeons had no anesthetics, and their patients had only the most rudimentary ideas of cleanliness. It traces the slow progress of medical science in that century, through innumerable contributions, large and small, but especially those of Hermann Boerhaave. It also traces the development of medical ethics and medical organizations through innumerable conflicts of specialty with specialty and of one profession with another. The text is made readable by the author's clear, unaffected style and by his choice of a wealth of vivid detail. The work is carefully documented, annotated, and indexed. The printing is flawless and the makeup attractive. This book is recommended to everyone who is interested in the continued progress of medicine both as a science and as a profession.

Digitalis. Compiled and edited by E. Grey Diamond, M.D., Professor and Chairman, Department of Medicine, University of Kansas Medical Center, Kansas City. Cloth. $7. Pp. 255, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1957.

This book consists of a collection of papers presented at the University of Kansas Medical School during a two-day symposium in February, 1956. Several additional papers on the history and metabolic fate of digitalis are also included. Since digitalis is currently the most frequently used, and probably misused, therapeutic agent for the relief of cardiac decompensation, the editor should be commended for making a review of this nature on this drug available to the medical profession. The value of this volume is somewhat lessened by the uneven quality of some of the papers. For example, the chapter on the pharmacological basis of action pales by comparison with the more thorough presentation of material in the following sections on the physiological actions, the metabolic fate, and the therapeutic applications of digitalis and its glucosides. The absence of a bibliography in several papers is unfortunate. There is a particularly interesting chapter on the auricular arrhythmias caused by digitalis overdosage. It is disappointing that a discussion of the treatment of the auricular arrhythmias is not included. The book is well indexed and typographically and otherwise

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These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

pleasantly readable. Perhaps the most stimulating portion of this volume is the panel discussion. The editor, acting as moderator, encouraged a clarification of certain controversial statements made by some of the contributors. Here the greater therapeutic range for gitalin, advocated by Batterman, and the safety of the acetyl strophanthidin test by Lown were placed in a more proper perspective. Although this book is not without faults, it affords an excellent review of the subject, representing an extensive assemblage of information and experience with digitalis. It should be a useful and provocative source book for the practitioner and the student interested in the pharmacology and clinical use of digitalis.

Human Blood Coagulation and Its Disorders. By Rosemary Biggs, B.Sc., Ph.D., M.D., Graduate Assistant in Department of Pathology, Radcliffe Infirmary, Oxford, and R. G. Macfarlane, M.A., M.D., F.R.S., Clinical Pathologist to Radcliffe Infirmary. Second edition. Cloth. $8.50. Pp. 476, with 53 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1957.

This new edition of a well-known book should be of great value to the student of coagulation, featuring as it does the coagulation disorders. One hundred ninety-four pages are taken up with the theories of blood coagulation and various blood clotting factors. There is an excellent section on hypoprothrombinemia, a relatively small one on hemophilia, and a good section on fibrinogen deficiency. The section dealing with thrombosis and anticoagulant therapy is outstanding, but the clinical sections are relatively poor and contain little information. Thus, the general subject of hemostasis and the hemorrhagic disorders is not as well covered as it might be. This is perhaps due to the particular bias of the authors, who have been among the foremost students of blood coagulation but whose work with clinical material has not been correspondingly as great.

Clues to Suicide. Edited by Edwin S. Shneidman, Ph.D., and Norman L. Farberow, Ph.D. Foreword by Karl A. Menninger, M.D. From Veterans Administration Neuropsychiatric Hospital and Veterans Administration Mental Hygiene Clinic, Los Angeles. Investigation supported in part by research grant, M-1074, from National Institute of Mental Health, of National Institutes of Health, U. S. Public Health Service. Cloth. $5.50. Pp. 227. Blakiston Division, McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36; 95 Farringdon St., London, E. C. 4, England; 253 Spadina Rd., Toronto 4, Canada, 1957.

These 18 chapters by as many authors cover various aspects of suicide. The editors demonstrate that, although many persons who never attempt suicide imply that they are considering it, few people commit suicide without giving clues that herald the actual event. If these communications are heeded and efforts made to interrupt the otherwise natural course of events, many suicides can be prevented. Suicide ranks among the first 10 in the list of causes of death in the United States, and, as such, it is of great importance to the physician. Since suicide affects society in many ways, the contributors to this volume are concerned with the cultural, sociological, legal, medical, and psychological aspects of the problem. This book, therefore, is a searching survey, not a definitive evaluation, and its value lies in this fact. Part 1, in addition to describing an experimental approach to the psychological aspects of suicide, deals with theoretical considerations. There are five chapters on the meaning of suicide as seen from as many viewpoints. Three chapters broaden the general discussion with their focus on the religious, legal, and sociological implications of this problem. The nine chapters in part 2 illustrate clinical aspects of suicide, including brief descriptions of the psychotherapy of suicidal patients and some pertinent suggestions for suicide prevention. The papers are slanted more to the psychiatrist than to the general practitioner.

Psychiatry and the Criminal: A Guide to Psychiatric Examinations for the Criminal Courts. By John M. Macdonald, M.D., Assistant Professor of Psychiatry, University of Colorado School of Medicine, Denver. Cloth. $5.50. Pp. 227. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

A guide in the difficult area of forensic psychiatry is here presented briefly and concisely. That it will achieve one of the stated aims of stimulating interest in entering the field is doubtful, but the practical experience represented is valuable. Following a brief treatment of the sociological, biological, and psychological factors of criminal behavior, the problem of responsibility is considered. The difficulties in avoiding the right-wrong, irresistible impulse test of responsibility is demonstrated, together with the attempts to develop sounder concepts, based on a psychiatric orientation. The recognition of the influence of unconscious on conscious processes and that a reverse influence also operates forms a sound viewpoint in determining responsibility and management of the criminal. The special problems involved in the examination for court purposes and some of the more common reactions, such as the Ganser syndrome and simulated insanity, are outlined. It is pointed out that narcoanalysis is not an infallible device and involves special ethical considerations. Amnesia, epilepsy, sex offenses, and alcoholism are also discussed. Useful information of a practical sort is pointed out in the sections on preparation of reports and appearance on the witness stand. This useful presentation of the neglected field of the psychiatric examination and management of the criminal stresses rehabilitation rather than revenge.

QUESTIONS AND ANSWERS

COMPLICATION DUE TO STEROID THERAPY

To THE EDITOR:—*A 60-year-old woman has had rheumatoid arthritis for the past three years. She was maintained first on therapy with cortisone acetate for two years and then with 5 to 10 mg. of prednisone daily for about one year. This was the only therapy that would give her relief. After the latter period of therapy, a perforated duodenal ulcer was repaired surgically. Since that time, the patient has been bedridden but has not received further steroid therapy. Her joints, especially her fingers, are swollen and painful, but she does not have marked deformity of the joints or extremities. Would it be advisable to again attempt steroid treatment for short periods? It has been six months since the operation. Would ACTH be contraindicated? The patient gets no relief from any other therapy and believes that she could walk again if she received the steroids.*

J. L. Gardner, M.D., Hendersonville, N. C.

ANSWER.—This difficult clinical problem is frequently encountered in rheumatic disease centers. The patient had one of the more serious complicaions of corticosteroid therapy for rheumatoid arhritis, with a fortunate termination. Most investigaors and experienced clinicians would advise that, n a patient who recently has had an ulcer during corticosteroid administration, it would be better not to give corticosteroids. However, under certain circumstances the decision is made to readminister hese drugs even though risks may be greater than average. All nonsteroid therapy that can reasonably be expected to relieve the patient should be thoroughly tried. If gold therapy has not been adequately used, it would be wise to attempt to suppress the rheumatoid activity with this form of herapy. If one or two large joints are persistently affected, trial of intra-articular corticosteroid might be found adequate so that systemic steroids may not be needed. If gold cannot be tolerated or if it and other treatment are ineffective, a reconsideraion of corticosteroid therapy is justified. The paient and all concerned should be fully aware of all he circumstances and factors involved. If, after careful consideration, it is decided that the potenial benefit outweighs the risk of steroid therapy and if the patient fully appreciates the hazards involved, cautious trial of the treatment may be decided on. Corticotropin needs to be considered in the same way as corticosteroid. There is no difference between the action of these hormones in this set of circumstances. That the ulcer has been healed for six months or longer is no assurance that a new ulcer or reactivation will not develop. Because a recent peptic ulcer has occurred, even though it is healed, there is greater risk of peptic ulcer complicating readministration of steroids. Although there is some suggestion that the new synthetic corticosteroids may have less ulcerogenic properties, ulcers have developed in patients receiving all of the currently commercially available steroids, including triamcinolone diacetate and methylprednisolone.

If it is decided to readminister corticosteroid to this patient, an upper gastrointestinal series and tests for occult blood in the feces should be made before commencing this treatment. Had partial gastric resection been done after perforation of the previous ulcer, there would be less risk of ulceration with readministration of steroids. One of the new synthetic corticosteroids (triamcinolone or methylprednisolone), in a dosage not exceeding 8 mg. daily, should be adequate for the desired partial suppression. Large doses of antacids should be given during steroid administration. Frequent blood cell counts and tests for blood in the feces are advisable, and a gastrointestinal series should be done every three months while the patient is receiving this treatment. If the steroid therapy does not give good results, it should be stopped.

FLARING OF XIPHOID AND COSTAL CARTILAGES DURING PREGNANCY

To THE EDITOR:—*A young woman noted during her first pregnancy a flaring of xiphoid and costal cartilages of the 9th and 10th ribs on the left side of the thoracic cage; this has persisted for eight months after delivery. Would some kind of binding help restore cosmetic appearance?*

M.D., Virginia.

ANSWER.—It is not felt that this flaring is a result of the pregnancy. If the woman is quite young, there is, of course, the possibility that there might have been some vitamin deficiency which would predispose to the flaring of her ribs. It is rather doubtful that any sort of binder or appliance would help to correct the deformity, though it might be worth trying. A tight brassiere, with a broad band on the lower portion, might be sufficient to do some good.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical r other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain he writer's name and address, but these will be omitted on request.

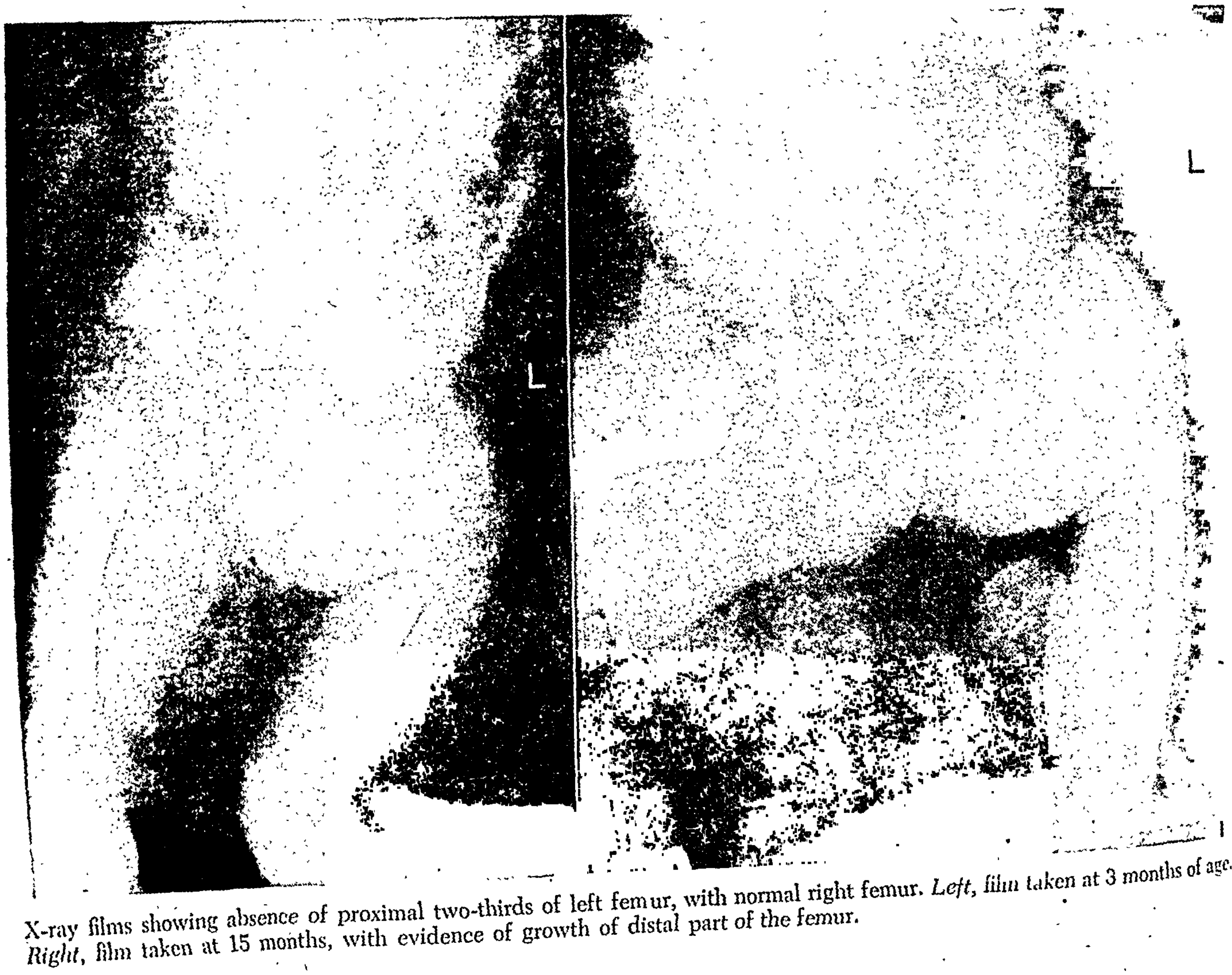
CONGENITAL ABSENCE OF FEMUR

To the Editor:—*A 15-month-old girl with congenital absence of the proximal two-thirds of the left femur has been brought to the United States from South America. X-ray films (see figure) show no ossification centers of the femora capitis and trocanters. Comparison with films taken eight months earlier revealed progress in the growth of the distal part of the femur. An orthopedic center in the United States advised amputation of girl's left foot and application of a prosthesis. Is there any possibility that the proximal ossification centers of the femur might appear spontaneously in the future? Might use of growth hormone, if available in pure form, induce the appearance of those centers? Would autografts taken from carpal bones or the fibula be useful?*

M.D., New York.

Answer.—The answer to all three questions is no. The advice that the parents have received regarding the amputation of the foot and the application of a prosthesis is sound. The question is only when this had best be done. There is no harm in waiting, and, in the interim, an ischial weight-bearing brace with adjustable length could be made and she could be trained in its use.

Answer.—The answer to the first question is no. One might state further that, if the proximal ossification centers of the femur did appear, there is so much soft tissue shortening that it would not do any good. There is no reason to expect that a growth hormone might do other than induce growth where cells of a certain growth potential are present. If those cells are not present, the growth hormone cannot produce them. Autografts from the carpal bones or the fibula, even including the epiphysis, are theoretically and perhaps actually feasible at the present time, but the soft tissue shortening in the leg is such that no useful purpose could be served even if the grafts were successful. The following treatment, however, has been successful. If arthrodesis of the remaining portion of the femur and the innominate bone on the same side is done in the proper position, a satisfactory range of flexion, extension, abduction, and adduction can be obtained. Further, a 180-degree rotational osteotomy of the tibia will bring the foot into such a position that the ankle joint can act as a knee joint and the action of the gastrocnemius-soleus muscle groups on the oscalcis can be made to extend the knee joint of a prosthesis, which can then be satisfactorily fitted without amputation and without discarding any useful structure.



X-ray films showing absence of proximal two-thirds of left femur, with normal right femur. *Left*, film taken at 3 months of age. *Right*, film taken at 15 months, with evidence of growth of distal part of the femur.

STATIC EDEMA

To the Editor:—*A 41-year-old man has suddenly developed pitting edema of the feet, ankles, and calves, which recedes almost completely over night. He walks 8-15 miles per day, and he eats a high protein diet. Blood protein level, complete blood cell counts, and findings in repeat urinalyses are all normal. There is nocturia one to two times regularly. Blood urea nitrogen levels were recently 23.1 and 25 mg. per 100 cc., and the phenolsulfonphthalein excretion was 40% the first half hour, 55% in one hour, and 63% in two hours. Protein-bound iodine level was 2.6 mcg. per 100 cc., and the serum cholesterol level was 252 mg. per 100 cc. He eats daily about 1 lb. of raw cabbage and 1 lb. of raw carrots. Is it possible that this intake of these vegetables could play a part in the edema?*

William R. Moses, M.D., Falls Church, Va.

Answer.—Edema of cardiac and renal failure can apparently be excluded in this person. In addition, there is no evidence that the edema is secondary to hypoproteinemia and hyperlipemia. The daily ingestion of unsalted large quantities of raw cabbage and raw carrots does not appear to have a causal relation to the edema. However, it may be that this individual is dipping these vegetables in sodium chloride while eating them. These raw vegetables have a relatively low content of chloride and sodium, but it is of interest that both contain a considerable amount of potassium, which has a diuretic action, in contrast to the water-retaining effect of chloride and sodium. Further, raw carrots contain a large quantity of vitamin A. This consultant, therefore, concludes that this man's edema is most likely static in type. It may be due to obstruction of venous or lymph vessels of the legs, and this possibility should be excluded. There are rare instances of this type of edema in which it is difficult to assign the exact cause.

Answer.—The low protein-bound iodine and elevated serum cholesterol levels, coupled with the other findings, suggest a hypothyroid state, with perhaps some cardiac involvement. In view of the very high protein diet and the other indications of adequate nutrient intake, it seems improbable that the findings are due to a dietary deficiency of protein. The informant does not indicate how long the patient has consumed the quantity of 1 lb. of raw cabbage per day. Nevertheless, it seems possible that, if this level of consumption has been continuous over a prolonged period, the patient may have diet-induced hypothyroidism, since it is known that cabbage contains goitrogenic substance. It has long been known that large quantities of cabbage fed to rabbits will produce goiter. Both thiocyanate and the goitrogen, L-5-vinyl-2-thiooxazolidone, have been incriminated. The latter occurs in a considerable number of members of the genus Brassica. Recent evidence from Australia has demonstrated that dietary goitrogens can, in fact, alter iodine metabolism in man. Accordingly, it would seem logical to interdict the large quantities of cabbage in the diet of this patient and to obtain further evidence concerning the thyroid function and changes in this during the weeks after omission of cabbage from the diet.

This consultant has been unable to find any reference to an effect of large amounts of raw carrots which might bear on this problem. During periods of starvation it is true that individuals subsisting to a large extent on root crops (turnips, carrots, and tubers) may develop hypoproteinemic edema. This would certainly not seem to apply in the present instance. There exist some indecisive claims in the literature concerning the goitrogenic influence of avitaminosis from deficiency of vitamin A, but, again, the quantity of vitamin A (or its precursor, carotene) in this patient's diet is clearly abundant. The one diet-induced nondeficiency edema which has been widely studied is "epidemic dropsy," which has been reported in India. This syndrome is characterized clinically by cardiovascular, cutaneous, and alimentary manifestations which, superficially, resemble beriberi. Onset may be gradual or sudden, and diarrhea is present and continuous. Edema of the feet and legs occurs, and the skin exhibits hyperemia with vascular mottlings and, sometimes, petechia. Evidence now seems convincing that the toxin concerned is from contamination of mustard oil by argemone oil (from the prickly poppy, Argemone mexicana). There is no reason to suspect this agent in the present case.

CONTRAINDICATIONS TO CIRCUMCISION

To the Editor:—*Would any of the following conditions be considered contraindications to circumcision, done at the age of 8 days? These conditions include (1) prematurity, i. e., about 4 lb. (1.8 kg.); (2) neonatal complication, such as cyanosis, infection, or excessive weight loss (if the infant has recovered by time of circumcision); (3) physiologic jaundice; and (4) erythroblastosis fetalis and other hematological conditions. Would vitamin K protect against bleeding, since there is some hepatic effect in all the above conditions? In general, is there any need to postpone the procedure if the neonatal course is abnormal?*

Milton R. Aisenson, M.D., Flushing, N. Y.

Answer.—No hard and fast generalizations can be made in answer to these questions, because circumcision has probably been safely carried out in each of the listed conditions. However, conservative management should take the following information into consideration: 1. Coagulation defects (low prothrombin content and decreased plasma thromboplastin component and proconvertin) are found in both the full-term and the premature infant during the neonatal period. These defects potentially lead to excessive bleeding (Aballí and others: A.M.A. J. Dis. Child. 94:589, 1957). Whereas vitamin K controls these deficiencies in the full-term infant, it is less effective in the premature child. Circumcision should therefore be deferred in the latter for a period of about three to four weeks. 2. It is difficult to conceive that within a period of a week an infant should have recovered completely from the complications mentioned. Here, too, circumcision should be deferred. 3. Physiologic jaundice is no contraindication to circumcision. 4. The patient with erythroblastosis fetalis presumably is still under surveillance, and elective operative procedures should be postponed until the hemolytic process has subsided. In hemorrhagic disease of the newborn, congenital thrombocytopenic purpura, and those coagulation disorders occurring in the newborn infant with a suspicious family history of bleeding (classical hemophilia and other subtypes of this disease), operative procedures should be avoided until the particular defect has been investigated. With the exception of hemorrhagic disease of the newborn, vitamin K is ineffective in improving the bleeding disorders mentioned. In general, it is advisable to postpone circumcision within the first week of life in situations where an underlying bleeding disorder may be operative or where the neonatal course is complicated by serious illness. Unfortunately, there are no simple laboratory procedures that serve as a screening test for possible clinical bleeding.

MALIGNANT SYNOVIOMA

To the Editor:—*In May, 1949, a high amputation of the right thigh was done on a 21-year-old woman for malignant synovioma of the right knee of two years' duration. In September, 1955, biopsies were performed on both breasts and six tumors were removed. The pathologist reported metastatic synovial carcinoma. Roentgenograms in July, 1956, revealed a mass in the right hilar region. In April, 1957, two areas in the right hilar region were found, and these have increased slightly. On Feb. 3, 1958, the patient was given an initial dose of 10 mg. of nitrogen mustard intravenously and daily thereafter for a total of 40 mg. She has been comparatively symptom free, taking care of a house and two active children. Considering the abnormally long survival with this highly malignant tumor, is there any suggestion as to additional therapy? Because of the poor prognosis, no therapy was given prior to the nitrogen mustard other than surgery.*

Albert I. Clark, M.D., Shreveport, La.

Answer.—According to Ackerman and del Regato (Cancer, ed. 2, St. Louis, C. V. Mosby Company, 1954), patients with undifferentiated fibrosarcomas, liposarcomas, leiomyosarcomas, angiosarcomas, rhabdomyosarcomas, and synovial sarcomas, as a group, have a poor prognosis, no matter what the treatment, and only rarely can a patient be saved by initial radical surgery. In the case of synovial sarcoma (Willis, R. A.: Pathology of Tumours, St. Louis, C. V. Mosby Company, 1948), the lungs are the main site of metastases, which may appear several years after removal of the primary growth. It seems reasonable to assume that the pulmonary nodules in this patient are metastatic. It is not clear why chemotherapy was used in February, 1958, or whether it had any objective effect on the pulmonary lesions or on the clinical condition of the patient. If either subjective or objective improvement was noted, maintenance chemotherapy would certainly deserve a trial, especially in view of the patient's youth and the ultimate gravity of her prognosis. Either sterile mechlorethamine hydrochloride or triethylene thiophosphoramide (ThioTEPA) could be given. The latter agent has the advantage of greater ease of administration and absence of clinical toxicity. Hematological depression occurs with either drug, but it can be controlled, is reversible, and is not too great a penalty for control of a lethal disease. A recommended dosage schedule would be 0.1 mg. per kilogram of body weight of mechlorethamine or 20 mg. of triethylene thiophosphoramide intravenously every 10 days. A white blood cell count should be obtained prior to the injection, and, if below 3,000 per cubic millimeter, the dose should be reduced. If it is below 2,000 per cubic millimeter, the dose should be omitted. An intramuscular injection of a long-acting adrenocorticotropic hormone (40 units) given at the time of chemotherapy is good adjuvant therapy in such cases.

CAUSE OF JAUNDICE

To the Editor:—*Please give information on the possible causes of jaundice in the following case. A 50-year-old man was operated on for obstructive jaundice. The postoperative diagnosis was chronic pancreatitis, based on the finding of a hard, enlarged, nodular head of the pancreas. The biliary duct system was normal in all respects, except for some adhesions about the gallbladder. Probes from 2 to 10 mm. in diameter were easily passed through the ampulla of Vater. The liver, except for a rounded edge, was apparently normal. It is not believed that the jaundice was caused by obstruction in the pancreatic portion of the common bile duct. Could hepatitis be a cause of the jaundice in this case? Is hepatitis an accompanying feature in pancreatitis?*

M.D., New York.

Answer.—If the common bile duct in this patient was not obstructed, the jaundice would have to be explained on the basis either of some form of hepatitis or intrahepatic malignancy, or of a hemolysis. Cirrhosis was apparently absent on gross examination of the liver. Liver function tests in all of these conditions would be helpful in distinguishing between them and common bile duct obstruction. A drug-induced jaundice, such as that from chlorpromazine, however, can produce results of liver function tests similar to those observed in obstruction.

CHRONIC AMEBIASIS

To the Editor:—*A 35-year-old man has chronic amebiasis with ulcers of the colon. He has complained of recurrent diarrhea with blood and mucus in the stools for more than four years, with severe pain in right upper abdominal quadrant. Since the onset of the disease, full courses of therapy with emetine hydrochloride, chiniofon, diiodohydroxyquin, carbarsone, Comoform (biallylamicol hydrochloride), and antibiotics, mainly oxytetracycline and chlortetracycline alone or in combination, have been given. After each treatment, the patient improved but always relapsed. Recently, the relapses have become more frequent and refractory to treatment with the above drugs. The patient's general condition is getting worse. Since January, 1958, he has taken 3 capsules of oxytetracycline and 1 Gm. of carbarsone daily, but the abdominal pain has not been relieved and now radiates to the shoulder and back. Fluoroscopy and roentgenograms revealed multiple ulcers of the hepatic flexure of the colon. At present, no amebas are found in the stools. The liver is palpable one fingerbreadth below the right costal margin. Results of liver function tests are normal. The patient has no fever but is emaciated. Are there any drugs that will completely cure amebiasis? Can amebic ulcers of the colon be cured by repeated use of amebicides? Would resection of the ulcerated position of the colon help this patient?*

Wan Sheng Chhuang, M.D., Formosa, China.

Answer.—The case related suggests repeated reinfections by the Entamoeba histolytica, possibly with the development of a superimposed ulcerative colitis of a variety caused by some other infectious organism. This statement is made because the physician making the inquiry states that the patient has had "full courses" of treatment with the accepted amebicides. It is inadvisable, however, to give such large doses of carbarsone over an extended period of time. The proper combination of emetine hydrochloride, carbarsone, and one of the oxyquinoline drugs, given in suitable amounts properly timed, almost invariably eradicates the amebas from the intestine. The problem of reinfection, however, is the important one. Amebic ulcers usually heal after eradication of the ameba. If such a condition is due to amebiasis, resection should almost never be considered. It is important to determine the nature of the present ulcerative condition of this patient's intestine.

KERNICTERUS

To the Editor:—*A patient, aged 24, is presently three and one-half months pregnant with her fifth pregnancy. She is Rh-positive; her blood type is "O"; and serologic studies were negative. When she was 17 years of age, her spleen was removed because of severe spherocytosis with jaundice and secondary anemia (familial hemolytic jaundice), and later a stone was removed from her common bile duct, which was producing biliary colic. Her gallbladder was normal. Her second pregnancy was uneventful except that the baby developed severe icterus neonatorum, which resulted in a cerebral hemorrhage and spasticity. Her third pregnancy was uneventful, with the exception that the infant developed moderate jaundice. The fourth pregnancy was uneventful, and the infant seemed normal at delivery; however, by the sixth day the child developed a deepening jaundice, went into opisthotonos, and died. The mother had had the usual prenatal medication to prevent anemia and to supply adequate calcium and vitamins. Prior to delivery, she received vitamin K for 10 days, and after delivery both infant and mother were given this by injection. Subcutaneously given fluids were supplied the infant, but to no avail. Please give advice and counsel as to what to do for this patient. Can splenectomy be performed in a newborn infant?* *M.D., Wyoming.*

Answer.—This query presents many problems. Hereditary spherocytosis is seldom manifested in the newborn period, and kernicterus has been described in only one case, so that it is unlikely that these children have this disease at birth. Other conditions must be strongly considered in this case. The most likely is erythroblastosis, despite the fact that the mother is Rh-positive. ABO and other less common blood groups may lead to severe erythroblastosis. The other possibility is that of vitamin K intoxication. Large doses of vitamin K have been known to cause kernicterus. During this pregnancy, the mother's blood should be investigated for sensitization to A, B, and other rare blood group antigens. The father and the living children should also have their blood examined. In this manner, a fair guess may be made as to the possibility of the next child being affected with erythroblastosis. Vitamin K is probably not necessary, but, if given, it should only be given in 1-mg. doses once daily for three days. Exchange transfusion is the treatment of choice after the child is delivered. It should be performed as soon as a diagnosis of sensitization is made, either immediately after delivery or at the onset of jaundice from whatever cause. Exchange transfusion should be repeated within 24 hours if the bilirubin level remains elevated. A splenectomy would hardly be of any value, as the immediate danger is that of kernicterus and usually can be prevented by exchange transfusion.

PAINFUL EDEMA

To the Editor:—*A 31-year-old executive has had a hard, painful edema of the back of the left hand and the left wrist for four years. There has been no injury, and his history is entirely negative. The pain is practically continuous but varies in severity, and has a tendency to be most pronounced in the early morning. There is slight muscular atrophy of the affected extremity and a moderate limitation of the movements of the fingers and hand. Treatment, including that with hydrocortisone, x-ray, plaster immobilization, physiotherapy, and salycilates, has been tried without success. Please suggest a diagnosis and recommend treatment.*

M.D., Belgium.

Answer.—The diagnosis is dermatomyositis. The localization is unusual, but the combination of dermatitis and myositis, in an adult, with changes in the skin, muscle, blood vessels, and subcutaneous tissues of an inflammatory nature, could only indicate this relatively rare disease. There is no specific therapy. The treatments listed are the usual ones. If these have failed to relieve the condition, one can only hope for a localization of the disease to its present site and for the appearance of a remission, which not infrequently occurs and may be prolonged and even complete.

Answer.—From the description of the hand, the disease would seem to be in the nature of a localized type of lymphatic stasis. Since it has been present for four years, a biopsy of the most involved area would be indicated. For treatment, a brachial plexus block on the left side might be attempted. There is no notation that this patient has had adequate support to this hand in the nature of either mechanic's waste or fluffs followed by pressure from an elastic type of woven bandage.

ISOLATION OF PARAKEETS TO PREVENT TRANSMISSION OF PSITTACOSIS

To the Editor:—*In the Queries and Minor Notes section of* The Journal, *Sept. 7, 1957, page 113, the answer to the question on psittacosis stated that the dosage of tetracycline compound to render birds noninfectious should be interrupted and not less than 30 mg. over a period of 15 days. What is the maximum dose that may be given orally to a parakeet daily? How should the dosage be scheduled? Should it be administered in the feed or by an eyedropper? Does the recommended dosage cause diarrhea or other symptoms of toxicity? Can parents be assured the treatment is effective in eliminating carriers in 100% of the cases, or is it best to advise them not to keep psittacine birds?*

Albert R. Danes
1st Lieut. (VC)
73rd Med. Det.
APO 21, New York.

The above comment was referred to the consultant who answered the original question and his reply follows.—Ed.

To the Editor:—*Parakeets fed a mash containing tetracycline compounds consumed 20 mg. of the drug a day. This dosage caused anorexia and diarrhea. If this heavy dosage was continued for 5 to 10 days, some of the parakeets died and yeasts were isolated from the intestines. The daily oral intake of tetracycline compounds should not exceed 10 mg. The drug is administered either in a specially prepared medicated millet seed (developed at the University of California Medical Center, San Francisco) or in the drinking water. The hulled millet seed was impregnated with chlortetracycline at a level of 0.5 mg. of drug per gram of feed and administered for three consecutive days, followed by two days of feeding with regular seed, until the completion of five treatment periods (15 days of medication). The special feed may become available commercially in the near future. Drinking water is medicated at the level of 0.8 mg. of tetracycline per milliliter and is offered to the bird continuously for two to three weeks. The therapeutic results with the medicated water were similar to those with the feed, but the method is not considered the one of choice, because a parakeet's daily intake of water is small and because the solution deteriorates rapidly.*

The recommended dosage and treatment schedule caused no side-effects. The concentration and distribution of antibiotic in the organs were the same if the drug was given continuously or on an interrupted schedule. The drug stored in the spleen, kidneys, and liver assured adequate antibiotic levels while the birds were being treated. The treatment has rendered the parakeets noninfectious, and in approximately 98% of the birds properly treated the organs were found to be free from virus. One month after termination of the therapy, aviaries comprising several thousands of parakeets were freed from psittacosis, as proved by systematic examinations of the F_1 to F_4 generations. Since 5 to 20% of the immature parakeets offered for sale may be infected, parents are advised to purchase psittacine birds from aviaries or dealers who sell properly treated birds or who obtain their birds from breeding stocks proved free from psittacosis infection by laboratory tests. Until infection-free parakeets are made available by the trade and properly certified by the health authorities, the keeping and fondling of these pets constitutes some risk to children and perhaps even more risk to older members of a household.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

A. M. A. Asks Mortgage Guarantees for Nursing Homes . .
Congress Considering "Overhead" for Medical Research . .
Appropriation Requested for Research on Staphylococcus . .
Appeal Made to Save Medicine's Status in FCDA-ODS Merger . .

A. M. A. ASKS MORTGAGE GUARANTEES FOR NURSING HOMES

The American Medical Association believes Congress should authorize U. S. mortgage loan guarantees for proprietary as well as public and nonprofit nursing homes, hospitals, and chronic disease facilities.

Presenting the Association's testimony to a subcommittee of the Senate Banking and Currency Committee, Dr. R. B. Robins of Camden, Ark., recited the century-long interest of the A. M. A. in problems of the aged and said, "This interest continues right down the line to the family physician who is on the scene when the various medical crises occur in the lives of older people."

Dr. Robins, a past vice-president of the A. M. A. explained that a majority of state medical societies have committees working on problems of the aged, and that the A. M. A. in cooperation with the American Dental Association, the American Hospital Association, and the American Nursing Homes Association, is participating in work of a Joint Council to Improve the Health Care of the Aged. The Council's long-range goal, he said, "is better health for the aged; its most immediate concern is working out answers to meet the financial and social problems that accompany chronic illness."

Most of the aged population, Dr. Robins declared, need a certain amount of skilled nursing care and medical care, not necessarily expensive hospital care. They could receive "the maximum professional attention their condition calls for in a less expensive facility—a properly constructed and operated nursing home, with professional medical and nursing care at hand or readily available," he said.

Dr. Robins told the subcommittee that the nursing homes have difficulty obtaining credit on reasonable terms, because the usual lending agencies hesitate to take the risk on a "one-purpose" structure without government underwriting.

Rep. Thomas Curtis (R., Mo.) also testified in favor of mortgage guarantees for nursing homes, saying "Older people need more medical attention than younger people, but do not need constant doctor care, nor do they need constant nursing care. Yet ofttimes they are confronted with the choice of staying home or going to a hospital." (For more on Mr. Curtis' testimony see "Quote of the Week.")

Under present law, public and nonprofit nursing homes are offered federal help in the form of grants or loan guarantees, but this assistance is denied proprietary nursing homes, except in a few instances and then under terms that are too restrictive.

Rep. Thomas B. Curtis, testifying in support of federal mortgage guarantees for proprietary nursing homes, said:

"What should be one of the greatest boons to mankind has in some respects become a bane. I believe it is well within our power to give the boon real meaning. However, it requires some clear thinking of what should be done. . . .

"The problem of the aged is to a large degree a financial problem. Most older people are on fixed incomes. Pensions, social security or retirement have been thrown out of kilter. . . .

"One way in which we can help these older citizens is to analyze with some care just what their needs are and see if we cannot provide the facilities that are tailored to their needs. . . .

"What we need is not nursing homes in the traditional way we know nursing homes to be. Nor do we need old folks homes as we have known them. We need an entirely new type of facility. It may be a village of old folks, such as I have read has been established in Arizona. It may be just homes clustered around a medical facility that is set up to care for older people. . . .

"Ninety-seven per cent of the nursing homes for the aged today are private institutions. . . . All that is needed now is to give some encouragement to private enterprise to move more effectively into the area of administering to the needs of our aged people. The federal government is in a very logical position to do just this through the FHA program."

PLEA FOR "OVERHEAD ALLOWANCES" FOR BASIC RESEARCH

Before winding up its public hearings on the appropriations bill for the Department of Health, Education, and Welfare, the Senate subcommittee

(Continued on next page)

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Lown, B., and Levine, S. A.:
Current Concepts in Digitalis Therapy, Boston,
Little, Brown & Company, 1954, p. 23, par. 2.

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heard a new plea for allowing medical schools an other research groups up to 30% for overhead cost in connection with federal research grants. Th appropriation subcommittee headed by Sen. Liste Hill (D., Ala.) also was asked by a group of medical scientists for new funds for basic research ou side the framework of disease categories.

Dr. John B. Youmans, dean, Vanderbilt Unive sity School of Medicine and immediate past-pres dent of the Association of American Medical Co leges, made the plea for raising overhead costs fro the present 15% ceiling. He noted that medic schools are doing the greatest part of medical r search, while at the same time they are bein hard pressed for funds to maintain, enlarge, an improve their teaching programs.

"To contribute to the indirect costs of gover ment-sponsored research from tuition is, in effec to subsidize such research from the pockets of th students. The fact is that the medical school struggling to maintain themselves, should not b required to use their own limited funds for th indirect costs of this research, money which the cannot afford and which impairs their ability t maintain an adequate program of medical educ tion. It is not only fair just that the medical schoo be reimbursed for the total cost of this research, is also in the public interest."

Drs. Philip Handler of Duke University, Carro Williams of Harvard University Medical Schoo and Robert A. Aldrich, University of Washingto Medical School, asked for at least 20 million do lars for fundamental research projects and 10 mi lion dollars for training grants in the basic medic and biological sciences. They would have th money appropriated to the National Institutes Health.

Dr. Handler, who spoke for the Federation American Societies for Experimental Biology, te tified: "Applied medical research, quite properl has been supported on an expanded scale but, un fortunately, without a proportional expansion fundamental research. In consequence, fruitful cli ical investigations may shortly have gone as far a our basic knowledge of biology permits. It is there fore imperative that fundamental research be ade quately supported also."

AHA REQUESTS FUNDS FOR RESEARCH ON STAPHYLOCOCCUS

The Senate appropriations subcommittee concerned with federal medical spending has received an urgent plea from the American Hospital Association for research funds for prevention and control of Staphylococcus infections in hospitals.

"The need is critical and the problem transcends state boundaries," Dr. Frederick H. Wentworth, of the Ohio State Department of Health and a member of an AHA committee on infections within hospitals, told the subcommittee headed by Sen. Lister Hill (D., Ala.).

Dr. August H. Groeschel of the New York Hospital and member of the infections committee suggested one million dollars be voted for research through the National Institute on Allergy and Infectious Diseases, plus another $500,000 for the Communicable Disease Center for the conduct of field studies, for control activities, and to give added support to state laboratories. "This is a reasonable figure with which to initiate an expanded program," Dr. Groeschel declared.

The witness said that many of the country's hospitals already have had serious problems with staphylococci infections and that all hospitals have a potential problem. Dr. Groeschel cited the fact that infections from antibiotic-resistant staphylococci constitute the main difficulty. These strains are largely a by-product of the widespread use of antibiotics which eliminate the susceptible strains of staphylococci, he told the committee.

The most obvious examples, Dr. Groeschel said, are infections in the skin of newborn infants and children, in newly delivered mothers, in burns, and in incisions made during surgery and pneumonia in debilitated patients. "The problem is of special significance to hospitals because hospitals are clearly the principal reservoir of most antibiotic-resistant strains of staphylococci. . . . Patients who acquire these infections in the hospital are potential spreaders of resistant strains to the community after discharge."

Dr. Wentworth expressed the view that, if the problem "goes uncontrolled, there will be decreased public confidence in hospitals."

The committee has heard more than a score of nongovernmental witnesses representing a wide range of interests in the various items within the Health, Education, and Welfare budget.

APPEAL TO SAVE MEDICINE'S STATUS IN FCDA-ODM MERGER

In a letter to Chairman Chet Holifield of a House government operations subcommittee, the American Medical Association urges that health functions be recognized as a top level operation in any reorganization of the Federal Civil Defense Administration and the Office of Defense Mobilization.

The Holifield subcommittee has before it a presidential reorganization plan that would merge the two organizations into the Office of Defense and Civilian Mobilization. Instead of an independent agency—such as FCDA and ODM—the new unit would operate out of the President's Office, and he would have power to eliminate or reassign its responsibilities in any way he saw fit.

One result probably would be reassignment of health and medical functions of both the FCDA and the ODM to the U. S. Public Health Service.

The A. M. A. letter, signed by General Manager Blasingame, recounted that two years ago the House of Delegates approved the broad objective of strengthening the federal civil defense program, "but was of the opinion that the method of accomplishing this was a matter for determination by the Congress with the advice and assistance of the President and the state governments. . . ."

On the importance of medical operations, Dr. Blasingame declared: "The Association believes that the health and medical functions of the FCDA and the ODM must be maintained at top level in the organization of the proposed Office of Defense Civilian Mobilization for the good of our country and our people should our nation ever again be confronted with another national emergency."

The merger automatically will go into effect on July 1 unless prior to that time either House or Senate passes a motion of disapproval.

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MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.
1958 Annual Meeting, San Francisco, June 23-27.
1958 Clinical Meeting, Minneapolis, Dec. 2-5.
1959 Annual Meeting, Atlantic City, June 8-12.
1959 Clinical Meeting, *Dallas*, Texas, Dec. 1-4.

AMERICAN

June

American Academy of Tuberculosis Physicians, San Francisco, June 21. Dr. Oscar S. Levin, P. O. Box 7011, Denver 6, Secretary.

American Association of Neuropathologists, Claridge Hotel, Atlantic City, N. J., June 15-18. Dr. Leon Roizin, 722 W. 168th St., New York 32, Secretary.

American College of Angiology, *Fairmont Hotel, San Francisco*, June 21-22. Dr. Alfred Halpern, 15 E. 62d St., *New York 21, Executive* Secretary.

American College of Chest Physicians, *Fairmont Hotel*, San Francisco, June 18-22. Mr. Murray *Kornfeld*, 112 E. *Chestnut* St., *Chicago* 11, Executive Director.

American Dermatological Association, Challenger Inn, Sun Valley, Ida., June 4-8. Dr. J. Lamar *Callaway, Duke Hosp.*, Durham, N. C., *Secretary*.

American Diabetes Association, Mark Hopkins Hotel, San Francisco, June 21-22. Dr. Franklin B. *Peck Sr.*, 1 E. *45th St., New York* 17, Secretary.

American Electroencephalographic Society, *Hotel Traymore*, Atlantic *City*, *N. J., June* 12-14. *Dr. Jerome* K. *Merlis, Univ. Hosp.*, Baltimore 1, Secretary.

American Geriatrics Society, Mark Hopkins *Hotel*, *San Francisco*, June 19-20. *Dr. Richard J. Kraemer*, 2907 *Post Road; Warwick, R. I.*, Secretary.

American *Goiter* Association, *St. Francis* Hotel, San *Francisco*, *June* 17-19. *Dr. John* C. McClintock, 149½ Washington Ave., Albany, N. Y., Secretary.

American Life Convention, *Medical Section*, Broadmoor Hotel, Colorado *Springs*, Colo., June 9-11. Dr. John E. Boland, 5801 Sheridan Rd., Chicago 40, *Chairman*.

American Medical Association, *Sheraton*-Palace Hotel, San Francisco, *June* 23-27. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

American Medical Women's Association, Inc., San Francisco, June 19-22. Miss Lillian T. Majally, 1790 Broadway, New York 19, Executive *Secretary*.

American Neurological Association, Claridge Hotel, Atlantic City, N. J., June 16-18. Dr. Charles Rupp, 133 S. 36th St., Philadelphia 4, *Secretary*.

American Proctologic Society, Los Angeles Statler, Los Angeles, June 29-July 3. Mr. Norman D. Nigro, 10 Peterboro St., Detroit 1, Executive Secretary.

American Rheumatism Association, San Francisco, June 20-21. Dr. Edward F. Hartung, 580 Park Ave., New York 21, Secretary.

American Society of X-Ray Technicians, Adolphus Hotel, Dallas, Tex., June 7-12. Miss Genevieve J. Eilert, 16, 14th St., Fond du Lac, Wis., Executive Secretary.

American Therapeutic Society, Mark Hopkins Hotel, San Francisco, June 19-22. Dr. Oscar B. Hunter Jr., 915 19th St., N. W., Washington 6, D. C., Secretary.

Association for Research in Ophthalmology, Fairmont Hotel, San Francisco, June 23-27. Dr. Lorand V. Johnson, 10515 Carnegie Ave., Cleveland 6, Secretary.

Catholic Hospital Association of the United States and Canada, Atlantic City, N. J., June 23-26. Mr. M. R. Kneifl, 1438 S. Grand Blvd., St. Louis 4, Mo., Executive Secretary.

Eastern Psychiatric Research Association, New York Univ. Medical School, New York, June 5. For information write: Dr. David J. Impastato, 40 Fifth Ave., New York.

Maine Medical *Association*, The Samoset, Rockland, June 22-24. Dr. *Esther M. Kennard*, P. O. Box 240, Brunswick, *Secretary*.

Medical Library Association, Kahler Hotel, Rochester, Minn., June 2-6. Mrs. Henrietta T. *Perkins*, 333 Cedar St., New Haven 11, Conn., Secretary.

National Medical Veterans Society, San Francisco, June 21-22. Dr. Henry C. Beekley, 3117 *Warsaw* Ave., *Cincinnati*, *Secretary*.

North American Chapter of the International Cardiovascular Society, Sir Francis Drake Hotel, San Francisco, June 21. Dr. Henry Haimovici, 105 E. 90th St., New York 28, *Secretary*.

Society for Investigative Dermatology, Clift Hotel, San Francisco, June 21-22. Dr. Herman Beerman, 255 S. 17th St., *Philadelphia* 3, Secretary.

Society of Nuclear Medicine, Beverly Hilton Hotel, Los Angeles, June 19-21. Dr. Robert W. Lackey, 452 Metropolitan Bldg., Denver, *Secretary*.

The Endocrine Society, St. Francis Hotel, San Francisco, June 19-21. Dr. Henry H. Turner, 1200 N. Walker St., *Oklahoma* City 3, Okla., Secretary.

Woman's Auxiliary to the American Medical Association, San Francisco, June 23-27. Miss Margaret Wolfe, 535 N. Dearborn St., *Chicago* 10, *Secretary*.

Wyoming State Medical Society, Jackson Lake Lodge, Moran, 9-12. Mr. Arthur R. Abbey, Box 2036, *Cheyenne, Executive Secr*

July

American Society of Facial Plastic *Surgery*, *New York*, July 2 Samuel M. Bloom, 123 E. 83d St., *New York* 28, Secretary.

American College of Surgeons, *Sectional Meeting*, Concert Stockholm, Sweden, July 2-7. *Dr. Michael L.* Mason, 40 E. Eri Chicago 11, Chairman.

Idaho State Medical *Association*, Sun Valley, July 6-9. Mr. Arma Bird, 364 Sonna Bldg., *Boise, Executive Secretary*.

Intermountain *Pediatric Society*, Sun Valley, Ida., July 4-6. Thales H. Smith, 220 N. *University Ave., Provo, Utah*, Secretary.

Rocky *Mountain Cancer* Conference, Shirley-Savoy Hotel, De July 9-10. Alexis E. Lubchenco, 835 Republic Bldg., *Denver* 2, Chair

United States Section, International College of Surgeons, E ern Regional *Meeting*, *Manchester*, Vt., July 1-5. Dr. M. Le Brodny, 636 *Beacon St., Boston*, General Chairman.

August

American Congress of Physical Medicine and Rehabilitation, P delphia, *Bellevue-Stratford* Hotel, Aug. 24-29. Dr. Frances Bak Tilton Ave., San Mateo, Calif., Secretary.

American Hospital Association, Palmer House, Chicago, Aug. 1 Dr. Edwin L. *Crosby*, 18 E. Division St., Chicago 10, Director.

American Veterinary Medical Association, Sheraton Hotel, P delphia, Aug. 18-21. *Dr. J. G. Hardenbergh*, 600 *S. Michigan* B Chicago 5, Executive Secretary.

Biological Photographic Association, *Shoreham* Hotel, Washin D. C., Aug. 19-22. Miss Jane Waters, Box 1668, Grand Central P New York 17, Secretary.

Chemical Organization of Cells, *Normal* and Abnormal, Mad Wis., Aug. 21-23. Dr. J. F. A. McManus, Univ. of Alabama Me Center, *Birmingham, Ala., Chairman.*

International College of *Surgeons, Regional Meeting*, West Section, The *Riverside* Hotel, Reno, Nev., Aug. 21-23. For informa address: *Dr. Leo D. Nannini, 190 Mill St.*, Reno, *Nev.*

National Medical Association, Hotel Schroeder, Milwaukee, 11-14. Dr. John *T. Givens, 1108* Church St., *Norfolk*, Va., Secretar

Northwest Proctologic *Society*, *Sun Valley, Ida.*, Aug. 27-29. Dr. J McKay, 645 Medical Dental Bldg., Seattle, Secretary.

West Virginia State Medical Association, The *Greenbrier*, W Sulphur *Springs*, Aug. 21-23. Mr. Charles Lively, P. O. Box 1 Charleston 24, Executive *Secretary*.

World Medical Association. Copenhagen, Denmark, Aug. 15-20. Louis *H.* Bauer, *10* Columbus Circle, New York 19, Secretary-Gen

September

American Academy for Cerebral Palsy, Sheraton-Biltmore Ho *Providence*, R. I., Sept. 25-27. Dr. Raymond R. Rembolt, Unive Hospitals, *Iowa City, Ia., Secretary*.

American Association of Obstetricians and Gynecologists, T Homestead, Hot Springs, Va., Sept. 4-6. Dr. E. Stewart *Taylor*, 4 E. 9th Ave., *Denver 20, Secretary*.

American College of Physicians, Mid-West Regional Meeting, M waukee, Wis., Sept. 27. Dr. James F. Gleason, 7 S. Oxford *Ave.*, Atla City, N. J., General Chairman.

American Fracture Association, Skirvin Hotel, Oklahoma City, Okl Sept. 29-Oct. 4. Dr. H. W. Wellmerling, 610 *Griesheim* Bldg., Bloo ington, Ill., Secretary.

American Medical Writers' Association, Hotel *Morrison*, Chica Sept. 26-27. Dr. Harold Swanberg, 510 *Maine St., Quincy, Ill.*, Secreta

American Roentgen Ray Society, Shoreham Hotel, Washington, D C Sept. 27-Oct. 3. Dr. C. Allen Good, 200, 1st St. S. W., *Rochester*, Min Secretary.

Colorado State Medical Society, *Broadmoor* Hotel, Colorado Sprin Sept. 24-27. Mr. Harvey T. Sethman, *1612 Tremont* Place, Denver Executive Secretary.

Kansas City Southwest Clinical Society, Municipal *Auditorium*, Kan sas City, Mo., Sept. 22-25. Mr. A. L. *Bingham*, 3036 Gillham R Kansas City 8, Mo., Executive Secretary.

Kentucky State Medical Association, Brown Hotel, *Louisville*, Sep 23-25. Mr. J. P. Sanford, *1169 Eastern Parkway, Louisville* 17, Exec tive Secretary.

Michigan State Medical Society, *Sheraton-Cadillac* Hotel, Detr Sept. 30-Oct. 3. Dr. L. *Fernald Foster, 606 Townsend* St., P. O. B *539, Lansing, Mich., Secretary.*

Mississippi Valley Medical Society, *Morrison* Hotel, *Chicago*, Sept 24-26. Dr. Harold Swanberg, *510 Main St., Quincy*, Ill., Secretary

Montana Medical Association, Northern Hotel, *Billings*, Sept. 11-13 Mr. L. R. Hegland, P. O. Box *1692*, *Billings*, Executive Secretary.

Nevada State Medical Association, Elko, *Sept. 17-20.* Mr. Nelson F Neff, P. O. Box 188, Reno, Executive *Secretary.*

New Hampshire Medical Society, Mt. *Washington* Hotel, Br Woods, Sept. 19-22. Mr. Hamilton S. Putnam, *18 School* St., Co Executive Secretary.

Northeastern Section, American Urological Association, Eq House, Manchester, Vt., Sept. 12-13. *Dr. F. O. Harbach*, 831 James St., *Syracuse*, N. Y., Secretary.

Oregon State Medical Society, *Columbia Athletic* Club, Portla Sept. 3-5. Dr. Max H. *Parrott*, *1020 S.* W. Taylor St., Portland 5, Sec retary.

(Continued on page 28)

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 167, NO. 5

CHICAGO, ILLINOIS

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MAY 31, 1958

RESPONSIBILITY OF HOSPITALS IN GRADUATE MEDICAL EDUCATION

Robert I. McClaughry, M.D., Detroit

Each hospital approved for internship or residency represents itself to physician applicants as an educational institution. At present the main authority under which most interns and residents may be considered to fall is that as an employee of the hospital, and not as an enrollee in an educational program. There has been a reluctance of the medical staff to accept educational responsibility, and a significant factor in their reluctance has usually been a lack of authority to implement changes as they see fit. In order to perform their educational function, those engaged in instruction should be organized into a faculty, and in order to avoid omissions and duplications curriculums must be developed. The present status of hospitals in this country as regards acceptance of educational responsibilities leaves much to be desired, but a review of the factors at work suggests plans for improvement.

ARE WE SATISFIED with the job now being done in graduate medical education in the community hospitals in the United States? Obviously we are not. Discontent with conditions for educational accomplishment in these hospitals has already given rise to an organization which serves as a forum, the Association of Hospital Directors of Medical Education. For this organization to be most effective, however, it is necessary that its discussion be directed to the roots of our present unsatisfactory position. From the results of this search, an ideological basis must be found for actions to improve existing conditions. Only in this way will a lasting improvement in hospital educational programs be likely to result.

In this presentation, the results of several years of thought and study related to the basic nature of the problems facing us in hospital education are given. This will be my personal interpretation of many separate factors and trends. No apology is offered for the personal nature of this evaluation, nor is any brief held for its uncritical acceptance. I do request its serious consideration, however, for it provides the basis for suggested goals toward which our future efforts may be directed.

Responsibilities of an Educational Institution

Each hospital approved for internship or residency represents itself to physician applicants as an educational institution. It is to a position of educational opportunity that the appointment is made, and, if considerations of service and remuneration are not secondary to this, the hospital neglects the principal object of the appointment. Since it is the hospital which assumes the role of

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Director of Medical Education, Providence Hospital.
Read before the Association of Hospital Directors of Medical Education, Chicago, Feb. 8, 1958.

the educational institution, it can be seen that the primary responsibility for the excellence of its educational programs rests with each hospital itself and not with any outside agency.

There are only two real services which an educational establishment can offer. One of these is to provide the easiest possible access to opportunities for learning, and the other is to evaluate the accomplishment of the learner so that unsatisfactory progress in any area of work leads either to correction of the deficiency or to the timely elimination of the student unsuited to the task selected. If these two goals are chosen and closely adhered to, professional service becomes a major byproduct of the system. The individual who is thoughtfully encouraged to increase his professional stature continually gains in ability to perform useful professional services. On the other hand, the individual who is constantly called on for the repetitive performance of duties without continuing intellectual challenge is soon reduced to doing his tasks in a routine and perfunctory way. He will then soon lose the precious habit of mind which distinguishes the professional worker: the inner need to overcome his ignorance as completely and rapidly as possible.

If, then, elevation of the standards of hospital education is to be brought about, it must be accomplished by acceptance within the hospital of educational responsibility. Once this responsibility has been accepted, it no longer suffices to say that there is plenty of material for learning if only the interns and residents would take advantage of it. Rather, the questions which constantly recur are whether there is another opportunity for learning which may be suggested to the house staff and whether the fullest result (as measured by gain of knowledge and understanding) was obtained from past efforts.

This view also places external examinations in a different perspective. At present, the only usual formal evaluation of persons in graduate medical programs is that of examination by the American boards in the various medical specialties. While the definite value and importance of these examinations is recognized, this fact serves to indicate the degree to which the hospitals have abrogated their educational responsibility. The institution which desires to improve itself cannot permit evaluation to wait until after completion of its entire course of study. Periodic checks of progress are necessary in order to properly supervise the work of anyone undertaking specific educational objectives.

The process of supplementing the external examination with internal means of evaluation, however, promptly points to the lack of any curricular structure in graduate medical education. General goals have been fairly well established. That this is so is evident from the relative effectiveness of the board examinations in screening out those inadequately prepared for the certificate of the board.

For these general goals to be most useful, however, they must be critically considered from the standpoint of defining a specific body of knowledge and then of discovering the logical interrelationships among the various parts of the discipline. In this way, it is possible to divide the broad general goals into more specific subgoals which can be evaluated on a periodic basis, as most universities do each semester.

If this is done, the teacher can then have a clear idea of what is expected of him and of the student. We have seen examples of the clinician who talks well about perhaps three or four types of clinical problems and who repeats these talks on nearly every bedside teaching exercise he conducts. While this is an extreme example, it is true to a greater or lesser degree of all who use this method. It can, however, be minimized by careful planning. The usual result of any unplanned teaching exercise is that it causes frustration and loss of interest among those who participate. Without planning, no one can fit the presentation of a subject to a particular audience, regardless of how familiar he may be with the subject. This points to the need for knowing beforehand exactly what will be taught.

If, as has been suggested, a residency consists of the study of the same subjects in each of two or three years, with progression in responsibility as the chief ingredient of change, then this program can best be characterized as a technical training unsuited to a scholarly profession. If, on the other hand, each of the medical specialties does have a definite body of knowledge, the development of curricula for the orderly presentation of this information is sorely needed.

To recapitulate briefly, the basis for the unsatisfactory conditions in hospital medical education programs has been stated in terms of proposing two needed developments. One of these is the need for the hospitals to assume educational responsibility for the advancement of their appointees. The other, which is a corollary of the first, is the need to develop curricula for the orderly presentation of the content of the programs and to facilitate evaluation of accomplishment before completion of the course of study.

Development of Hospital Education

In order to understand the way in which the present circumstances have developed and to predict where the greatest difficulties will lie in bringing about projected changes, let us examine certain features of the historical perspective in hospital education. The changes which have occurred in all phases of medical education and also in the use of hospitals in the past half-century have been unprecedented. Many of these changes have specifically affected internships and residencies.

Perhaps the most clear-cut example of the effects of the change in the use of hospitals concerns the internship. In general, the medical school graduate of the first decade of this century left school with very little practical experience in the care of sick persons. As a result of this background, these graduates sought internships in which they would have opportunities for taking an active part in patient care without having the ultimate responsibility assumed by their colleagues who plunged directly into independent practice. The success of the internship has been clearly demonstrated by the growth of this form of medical training.

Almost simultaneously, however, the medical schools, largely under impetus from the Flexner report,[1] were instituting clinical clerkships. These exercises gave the medical students a great deal of opportunity for a supervised role in patient care. Along with this development, doubts occurred as to whether the clerkship had completely taken over the role previously played by the internship. The Advisory Committee on Internships to the Council on Medical Education and Hospitals of the American Medical Association considered this question and in their 1953 report[2] said, "In our unanimous opinion, a subsequent intern year, properly planned, continues to have an indispensable function in the doctor's education. True, when poorly planned, the intern year can seem at the time an onerous repetition of the clerkship, but even under these circumstances, in retrospect it has often seemed to bring confidence and skill in the performance of basic medical functions." In all of their discussion of the problem, however, it was only the feeling that the clerkship alone does not adequately prepare the physician for practice, and not a definition of what is to be added through the internship, which guided the committee.

The question remains, therefore, as to what is to be specifically expected of the internship. If the gaining of confidence and skill in applying already known basic information is the aim, this indeed constitutes a clinical apprenticeship; the chief role of the hospital staff becomes the provision of adequate supervision. My own feelings are not entirely clear, in part because my own internship did have value in my professional development and in part, also, because of the feeling that this development was, indeed, chiefly technical. In the absence of a defined scope for the internship, however, the value of its continued existence does seem doubtful. Can it be replaced by the study of a better delineated body of knowledge? If so, this will require definition of exactly what is to be studied.

A similarly striking effect on the goals in hospital educational programs has resulted from the formation and the increasing prestige of the specialty boards. Because of the advantages gained from certification by the boards, their requirements are generally regarded as the basis for planning a residency program. This is in sharp contrast to the present state of planning in medical schools, where the requirements of the state boards of medical examiners are really quite incidental to the individual schools' interpretations of how their programs may be strengthened. It is well to add, however, that it has not always been so and that the elevation of medical school standards to this point has indeed been one of the dramatic stories of American medicine.

One very significant change which has occurred, almost insensibly, in residency programs has been the replacement of accomplishment by periods of time as the criterion for completion of the residency. This has resulted in large part from the rapidly changing emphasis on specialization in medicine. The residency, as established by Osler and his colleagues at the Johns Hopkins Hospital, was essentially the selection and nurture of protégés by the professors in this outstanding medical school.[3] The aim was the preparation of a few men in an outstanding fashion for the then unusual career of teaching and research in the clinical fields. As the idea of residency in the various medical specialties spread, however, tremendous variations in the type and quality of such programs developed, and many physicians were spending only very short periods of time in such programs before setting themselves up as specialists. From this chaos, the Advisory Board for Medical Specialties and the Council on Medical Education and Hospitals have brought order by establishing minimum times to be spent in residency before admission to board examinations and, also, by approving hospital residency programs. These means, important as they are, represent only one part of the solution to the problem. Until the educational achievement of each resident is recognized as an obligation by his hospital, further progress seems unlikely.

Still another historical development which has had a striking effect on hospital education programs is the rapid increase in utilization of the hospital. Despite the fact that a decreasing proportion of hospitals have approved educational programs, there is a constantly increasing number of internship and residency appointments available to each physician applicant. Since the primary orientation of the present programs is toward the participation of interns and residents in patient care, their absence results in real problems in this area. Filling house-staff positions in order to meet service needs is a major concern of many hospitals, as is indicated by the urgency in appointing foreign graduates to vacant positions.

Another aspect in the change in hospital use is the decrease in numbers of charity patients. While we welcome this as an evidence of expanding economy and of the success of medical prepayment, it is not an unmixed blessing. The charity patient has played a key role in hospital education programs, even in private hospitals. Certainly, surgical program directors illustrate this condition most sharply, with their increasing concern for operative clinic material for their residents.

The shorter duration of hospital stay which has resulted from early ambulation of surgical patients and from increased public recognition that the hospital is no longer a place where one goes to die has also affected the pattern of education within the hospitals. With an increasingly rapid turnover of patients, a significantly greater portion of the time of the house staff is taken up by the initial examination of patients. To the degree that sufficient time is available both for the first acquaintance with the details of a patient's problem and for proper follow-up of his later progress, this is an advantage. A too frequent result, however, is that the physician is overwhelmed, and so a routine and slipshod job is done of all aspects of the study of the patient.

Organization for Education

All of these changes have resulted in increasing obligations on the hospital from the standpoint of medical care, which is its first responsibility. Since the educational function of the hospital is secondary, the usual absence of an effective instrument for the execution of this function serves to exaggerate the difficulties. It is to meet this problem that an effective organization for education within the hospitals becomes necessary.

The establishment of such an organization for educational responsibility must be a function of the medical staff along with the administration of the hospital. There are a number of reasons, however, why there is reluctance on the part of the medical staff to undertake this obligation. Probably the most significant is that membership on a hospital staff is predicated on ability to care for patients, with teaching interest and ability, in most cases, as an incidental characteristic only. Also, regardless of the type of hospital we may consider, the members of the medical staff are busy men, with heavy time obligations to their patients, to medical school teaching, or, less commonly, to research. So, time spent in other activities must be recognizably productive.

Planning of hospital educational activities seems to require spending nonproductive time. Each of us, to a greater or lesser degree, takes for granted the automaticity of a well-planned performance. Those of us who have conducted any public programs, however, can testify that the automatic appearance is a delusion. Yet even this realization does not serve to make able physicians anxious to spend time in such planning.

Another problem facing any group undertaking planning of graduate medical education curricula is the lack of guides to follow. As yet, we have only begun to see the results of various experimental programs tried in different hospitals throughout the United States. But, in general, departures from some modification of the apprenticeship principle for graduate medical education are still quite infrequent.

A constant discouragement to the medical staff in undertaking a great deal of work on the part of the hospital educational program is the competition which exists among hospitals for suitable candidates. A school without students doesn't have much meaning, yet this is precisely what is asked of many medical staffs. It is necessary, but very disheartening, to plan what shall be offered in an internship or a residency with the realization that the program being planned may never be put in operation because the positions will not be filled.

A significant factor in the reluctance of the medical staff to accept responsibility is their usual lack of authority to implement changes as they see fit. It is quite unusual, for instance, to have a specific budget established for hospital education. Yet this is one of the things most strongly stressed in the Functions and Structure of a Modern Medical School,[4] which represents a close counterpart to these programs. Also, the main authority under which most interns and residents may now be considered to fall is that as an employee of the hospital, and not as an enrollee in an educational program. These limitations in authority are often the source of resignations from positions of importance in planning for hospital education.

Principles for Effective Education

From the statement of the needs and the evaluation of the influence of certain events in explaining the development of our present situation, it is evident that the solution to our problems will not be a simple one. There are, however, certain principles which may guide the work toward greater effectiveness in hospital education. Neither these principles nor their statement is original with me. They have been derived largely from the striking analogy between the conditions which existed in the medical schools prior to the relatively recent reforms and those now existing in the hospitals.

The first principle is that those engaged in instruction should be organized into a faculty. The independent teaching of several men without consideration of what each is to do is wasteful both for the teacher and for the student. The individual merits of each man cannot be properly exploited without an organizational basis. The necessity for this development has long been recognized among the communities of scholars in universities; the need is equally great, in my opinion, in hospital programs. The pattern of the faculty will undoubtedly be unique. Neither the present organization of medical school faculties nor that of departmentalized hospitals seems best adapted to the needs of the suggested programs. It is probable, although, frankly, a little frightening from the standpoint of costs, that the development of the faculty organization will lead eventually to the use of full-time teachers, as it did in undergraduate medical teaching.

The second principle is that curriculums must be developed. It is probably unfortunate that, in thinking of curriculum, the common connotation is that of a rigid structure. The definition given by Deitrick and Berson in "Medical Schools in the United States at Mid-Century" impressed me because it did not include this emphasis. They said, "The curriculum is the loom on which the cloth of medical education is woven."[5] This places it in proper perspective—as a tool, not as a master. In curriculum development, a practical means is found for the implementation of the purposes stated earlier for an educational institution, namely, to provide opportunities for learning and to evaluate the use made of them. It is my firm conviction that each medical discipline has a distinct body of knowledge that can be defined adequately for proper curriculum development.

If this program is undertaken, a new scope will be given to the discussion of common problems in hospital education. All of the concerns with developing criteria for evaluating progress of the individuals within the various hospital programs, of the individual programs themselves, and of the standards for the programs throughout the country will require renewed attention.

In my opinion, this points to the ultimate goal of the Association of Hospital Directors of Medical Education. A significant factor in the assumption of educational responsibility by an institution is that it now should undertake participation in the program for accreditation. This leads to the statement of the last principle of the proposed solution, which is that the continuous elevation of educational standards should be sought by the participation of the responsible institutions in the procedure of accreditation.

The Association of Hospital Directors of Medical Education now represents the feeling of dissatisfaction with existing conditions in the hospital education field. It also constitutes a forum for discussion, aimed toward improving educational conditions. It appears logical that it might also develop into a selective society with the associated function of participating in accreditation. By this means, its aims could be accomplished without the necessity for becoming a pressure group but only by the time-tested means of pulling ourselves up by our bootstraps.

Summary

In establishing graduate medical education programs, hospitals are forced to assume responsibilities secondary to their primary reason for existence. These are the responsibilities of an educational institution, namely, to provide specified opportunities for learning and to evaluate the accomplishment of the learner. The present status of hospitals in this country leaves much to be desired in the acceptance of these responsibilities. A view of the influence of many factors on this present state of affairs provides perspective for improvements. An effective instrument to meet these educational responsibilities is required. Specific needs for a distinct faculty organization, for development of curriculum structures, and for participation of the hospitals in the elevation of educational standards are all derived by reference to the general experience of other educational efforts.

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OCCUPATIONAL THERAPY FOR OLDER MEN AND WOMEN.—Oberndorf opposed segregation of the sexes in recreation or in work, "the object being to offer the members of both sexes opportunity, no matter how tenuous, for mutual direct emotional expression." Our experiences with geriatric patients confirm the importance of a mixed group of males and females in occupational therapy. They will form attachments by visiting each other while working on their projects and this tends to improve their personal habits. Sometimes such a close relationship conduces to marriage of an elderly couple after the end of the hospitalization and helps to form a motivation to leave the hospital. (Geriatric patients frequently fear to leave.) The couples who work together in occupational therapy usually take a greater interest in recreational and outdoor activities and the relationship between them helps their adjustment to the hospital remarkably.—Kurt Wolff, M.D., Occupational Therapy for Geriatric Patients in a Mental Hospital: Therapeutic Possibilities and Limitations, *Journal of the American Geriatrics Society,* December, 1957.

OUTPATIENT CLINIC IN THE TEACHING PROGRAM OF THE VOLUNTARY HOSPITAL

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The plan here described resulted from recognition of the need for a continued house-staff training program, for an outpatient clinic, and for house-staff participation in its management. Each intern spends one half-day each week in this clinic. Instead of former arrangements by which the patient rarely saw the same intern twice, the scheduling and division of work is such that the same intern takes the history, does the initial physical examination, has the help and guidance of either a preceptor or the director of medical education, sees the patient again at subsequent visits, and follows him through consultations or hospitalization as the case may be. The organization of bedside rounds, clinical pathological conferences, and departmental conferences increases the effectiveness of the program. An outpatient service so organized enables the nonaffiliated hospital of moderate size to offer the intern substantial help as he makes the transition to full patient care and responsibility.

Many factors in the postwar years have caused the hospital of moderate size unaffiliated with a university to reevaluate its basic assets in order to maintain a place in competition with larger and more affluent institutions for house-staff service. Among these are the following factors: (1) the absorption by the federally subsidized institutions of a large number of graduate physicians through the attraction of good housing, adequate compensation, expanded and often university-supervised teaching, and arrangement for dependent care; (2) the great increase in medical techniques requiring house-staff service for performance and which must be available if the hospital is to maintain its position of supplying community care; and (3) the expansion of the insurance principle with corresponding reduction of clinic patients available for teaching. Many institutions of 250-to-500-bed status either have abandoned house-staff training programs in the face of such difficulties or have been deprived of approval of existing programs through failure to respond to the challenge offered.

An intern in our hospital during the years just preceding the entry of the United States into World War II—the period of many disconnected services of short duration—found the outpatient clinic largely an elective or drudge service held together by a few faithful physicians who donated their time to the care of their less fortunate brethren. One of us (F.S.) can well remember that, in the case of one revered man, who died in the service of his country, the simple announcement by the intern, "Doctor X will be unable to see his patients today, but I will be glad to help anyone who would care to stay," would result in at least 90% of the "clinic" departing until the next week.

The lush days of war work, service dependents' care, and home-physician shortage all but stifled the outpatient clinic. However, the return to a peacetime economy reestablished the need for an outpatient clinic and with it an increased demand for house-staff participation in its management. This was stimulated both by lack of time on the part of the attending physicians and by desire for work with his "own patients" by the house physician. The prewar intern found himself returned to this situation as "outpatient consultant" in the curious position of being resented on the one hand by the house physician for "taking over the patient," and on the other by the patient for not continuing the treatment. Furthermore, the neglected outpatient service had not been coordinated with the new rotating internship through medicine, surgery, obstetrics, gynecology, and pediatrics. It was still used as a stopgap service, usually four to six weeks as part of the medical service, so that a two-way objection to the outpatient service seemed quite valid. This was that the service was so short that neither patient nor intern was likely to see each other a second time, certainly not a third time. This militated against both a good continuing regimen for the patient and an interest in results for the intern.

In 1954, one of us (F.S.), a prewar intern and, from 1947, a postwar consultant, was made the medical director of the outpatient clinic, and at about the same time a news story of front-page interest pointed up these objections. A house officer in a university hospital clinic was shot to death by a discontented patient, and, when asked why he had shot this particular doctor, the patient is re-

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orted by the press to have replied, "They are all like; you never see the same one twice," or words lose to these.

It was decided then that this neglected outatient service could better serve both patient and loctor and, in being reorganized to this purpose, hould be able to demonstrate a community and ducational function difficult for larger and more mpersonal hospitals to duplicate, whatever their ther advantages, sufficiently satisfying a need for elf expression in training by the intern to stimuate application for house-staff positions. Accordngly, beginning in 1955, with the help of one of s (J.L.), then chief medical resident, the outpaent clinic service was reorganized. The present aper is a report of this organization and its relts to date.

Method

Each intern spends one half-day each week in ne clinic, a total of 26 days or approximately five working weeks" a year—about the average of his tay in the clinic under the old system. The new rrangement, therefore, cannot be said to have aken him away from other duties excessively. New atients, after interview by the social service worker determine eligibility and status and to take the ocial history, are assigned by appointment rotation an intern who then remains this patient's doctor r the remainder of his service unless for some alid reason on the part of the patient or physician change seems advisable; free choice of physician thus encouraged.

At the first visit, the intern records the history nd performs the complete physical examination, rdering such laboratory and x-ray aid as he thinks ay be indicated and the need of which he must e prepared to defend. Subsequent follow-up apointments are made for the intern's regular clinic, nd at the first of these the case is reviewed with a onsultant, one of the volunteer visiting staff who assigned to each intern at the beginning of the ear as preceptor. The intern's plan of investigation nd/or therapeutic regimen is criticized. The case continued under the care of the intern in the inic with as little interference on the part of the receptor as possible. If specialty consultation is quired or desirable, this is made to the several inics which are managed by the resident staff ith its staff specialist consultant. The resident may ither return the case to the intern or, if it proides sufficient teaching interest at the resident vel, assume responsibility himself. In either event, e intern follows through to the consultation. hould the resident take charge for this particular lness, for any subsequent complaint the patient turns to his own intern physician.

Patients requiring hospitalization automatically ll to the responsibility of the resident staff, but e intern is expected to follow his patient to and during the hospital stay, furnishing the hospital history, physical status, and the discharge note to the clinic record. Emergencies are, of course, met with the day they occur by whatever intern is on duty.

Obstetric patients are assigned as nearly as possible according to the expected date of delivery to the intern who would be on the inpatient obstetrics service at that time. The resident in obstetrics meets for one half-hour at each intern session, and all obstetric patients are seen by the intern with him at that time.

The preceptor concept is a somewhat broader one than that of strictly teacher or guide. He is expected to take a personal interest in the intern, helping him apply his knowledge of the art as well as of the science of medicine, assisting him in deciding his future course in the profession, and aiding in his personal, family, and financial problems as and if these arise.

The whole venture is coordinated by the medical director of the clinic (F.S.), who, in 1956, also assumed the position of director of medical education. Once a week he conducts clinic rounds in which hospitalized clinic patients are discussed, one by one, by the intern and resident responsible in whatever detail the problems of the case require. This discussion is most usually at the house-staff level, guided by the medical director (internist) with the help of the current clinic surgical consultant and a member of the staff of McAuley Clinic (the outpatient psychiatric clinic of the hospital).

The emphasis is on discussion of the patient as a whole, from his physical and emotional standpoint and in relation to his environment. This session helps the house officer's development of expression and crystallization of his course of action. We have thus far not required attendance at these meetings, yet they are on the whole better attended than many of the other meetings provided for the house staff.

Results

The program was entered into with some trepidation by many of the hospital personnel involved. Examples include the inconvenience entailed on other services the half-day the intern spends in the clinic, emergency service only being provided by the covering intern. There is also a certain amount of book-work added for the nursing personnel in the appointment books that must be kept for each intern. On the other hand, the student nurse gains by exposure to an office type of practice. Also, since we require a complete physical examination of every new patient passing through the clinic and since this requires a minimum of an hour, there has been some slowing of the reception of new patients, a matter that is disturbing to those used to only the service type of clinic. We feel this is necessary both for the training of the doctor and for the benefit of the patient. This feeling has been somewhat overcome by the fact that the complete examination at times will reveal conditions offering opportunity for study for the resident physicians, particularly the surgical residents. At the end of two years we have encountered no opposition to the continuance of the program, and we believe that it has been one of the factors attracting the full complement of house staff we have been able to maintain since its inception.

The entire program has developed to such proportions, particularly in the past two years, that its administration has become too much for the part-time physician with a private practice; therefore, the hospital has engaged a full-time director of medical education who will become the medical director of the outpatient clinic, thus coordinating the outpatient clinic with the hospital teaching services. We were fortunate in obtaining the services of Dr. George Reifenstein, who, being certified by both the American Board of Internal Medicine and the American Board of Pathology, is well qualified to conduct clinic bedside rounds and to supervise clinical pathological conferences and departmental conferences on morbidity and mortality.

While such a program is most easily started when there are sufficient house officers to fully staff the clinic service, it would seem possible to make it work with any number of house officers available, supplementing them with the attending staff, who would necessarily be the clinic attending physicians were there no house staff at all.

Summary

The outpatient service in the nonaffiliated hospital of moderate size may be organized to enhance the intern's postgraduate training in the direction of transition to full patient care and responsibility.

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EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES GETS UNDER WAY

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The Educational Council for Foreign Medical Graduates (ECFMG) has been carefully planned and established by the four organizations in the United States which are most closely concerned with the maintenance of high standards of medical education and service. These are the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Federation of State Medical Boards of the United States. The Council was established to make it possible for graduates of the 543 medical schools outside the United States who wish to further their training in American hospitals to obtain a basic certification in their own country which would serve the purpose of identifying them as qualified physicians once they enter the United States. Full functioning of the program is set for Jan. 1, 1960.

Since World War II the internships and residencies in our American hospitals have attracted a steadily increasing number of foreign medical graduates. Among the factors that have contributed to this development are the establishment of the State Department's exchange visitor program (based on the United States Information and Educational Exchange Act of 1948); the rapid growth of our hospitals since the Hill-Burton act of 1946, creating internship and residency positions in our hospitals considerably beyond the powers of our more slowly growing medical schools to provide interns and residents in proportion; and the growing tendency of medical graduates in large areas of the world to look to the well-equipped and research-motivated hospitals and clinics of the United States for advanced training in medicine much as our physicians looked to the noted teaching hospitals of London and Edinburgh or to the renowned clinics or faculties of medicine of Paris, Berlin, Dresden, Munich, or Vienna in the period immediately preceding World War I. The extent of this

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Executive Director, Educational Council for Foreign Medical Graduates.

development is evidenced by the recent census aken by the Institute of International Education nd the American Medical Association. It revealed hat in the academic year 1956-1957, 6,741 foreign nedical graduates from 88 countries were training n American hospitals, 4,753 as residents and 1,988 s interns.[1] Another thousand foreign medical grad- ates in our hospitals who were here permanently n immigration visas brought the total number of oreign medical graduates occupying internship or esidency positions in our hospitals up to more than ,700 in 1956 to 1957.

In view of these figures it is not surprising that e American Hospital Association, the American edical Association, the Association of American edical Colleges, and the Federation of State Med- al Boards of the United States had been showing ncern. With 7,700 foreign medical graduates in aff positions in our hospitals and more coming ch year, some central agency should be set up answer inquiries and serve as a source of authen- c information in this rapidly developing field, and me means should be established for making it ssible for graduates of the 543 medical schools tside the United States who wish to further their aining in American hospitals to obtain a basic rtification in their own country which would rve the purpose of identifying them as qualified ysicians once they enter the United States.

After three years of planning by the Cooperating ommittee on Graduates of Foreign Medical hools with Dr. Donald G. Anderson, dean of the niversity of Rochester School of Medicine, acting chairman, and Dr. Walter S. Wiggins, associate cretary of the A. M. A. Council on Medical Edu- tion and Hospitals, acting as secretary, the lucational Council for Foreign Medical Graduates . C. F. M. G.) was formally incorporated on ay 14, 1956, with a Board of Trustees of 10. The ard was constituted as follows: representing the nerican Hospital Association were Drs. Sarah H. utti and T. Stewart Hamilton; representing the nerican Medical Association were Drs. Edwin S. amilton and James R. Reuling; representing the sociation of American Medical Colleges were rs. J. Murray Kinsman and John McK. Mitchell; presenting the Federation of State Medical ards of the United States were Drs. M. H. Crabb d Dr. Elmer W. Schnoor; representing the public large were Drs. W. C. Davison and Aims C. cGuinness. Dr. Kinsman was elected president, r. Edwin S. Hamilton vice-president, and Dr. utti treasurer. The financing of the first two ars of operation was provided by a loan from the four sponsoring agencies and by grants from the Kellogg Foundation and the Rockefeller Foundation. Dr. Dean Smiley, formerly secretary of the Association of American Medical Colleges, was named executive director, and on Oct. 1, 1957, the E. C. F. M. G. formally opened its doors in offices at 1710 Orrington Ave., Evanston, Ill.

Informational Services

As an aid in the answering of letters of inquiry and in interviewing, the following printed materials have been developed and are available on request: (1) "Facts for Foreign Medical Graduates Planning Advanced Training in Hospitals of the United States," (2) fact sheet (describing the services of E. C. F. M. G.), (3) application form (for having credentials evaluated), (4) examination brochure (describing the American Medical Qualification examination), and (5) "Facts for Foreign Medical Graduates Contemplating Emigrating to the United States to Enter Practice."

Through the courtesy of the American Medical Association, the Association of American Medical Colleges, and the Graduate School of the University of Pennsylvania we have been supplied with distribution copies or given permission to reprint for distribution nine other brochures or leaflets of interest to selected groups of foreign medical graduates.

Evaluative Services

Credential evaluation is required of each candidate as the first step toward certification. Each foreign medical graduate is asked to submit photostated or certified copies of his chief educational credentials documenting the following facts: that he has had at least 18 years of formal education (elementary, secondary, collegiate, medical school, internship, or residency); that at least four of these years of training have been in a bona fide medical school recognized by the organized medical profession of the country in which the school is located and listed in the World Health Organization's "World Directory of Medical Schools"; and that he is licensed or eligible for licensure in the country in which he obtained his medical education.

Evaluation of the knowledge of medicine is determined by the American Medical Qualification Examination given twice each year, spring and autumn, in approximately 20 medical schools in the United States and in over 30 medical schools abroad. This is a 360-to-400-question, multiple-choice, objective-type examination, given in a morning and an afternoon session, all on one day. The questions for this examination are selected by the E. C. F. M. G.'s examinations committee of six medical educators, from the pool of questions which have been used in examining large numbers of National Board candidates and smaller numbers of State Board candidates. About 35% of the questions are devoted to clinical medicine, 20% to surgery, 15% to pediatrics, 15% to obstetrics and gynecology, and 15% to the six basic sciences.

The evaluation of the command of English is accomplished as follows: At the beginning of the afternoon session of each examination, the proctor reads in English the history of a typical medical illness in the words of a patient. The candidates take such notes as they wish and then write a summary of that history in English as they would write it as the patient's case history in a hospital chart. This simple test checks the candidate's ability to understand spoken English and his ability to write English. His ability to read rapidly and comprehend written English is tested by the American Medical Qualification Examination itself. United States consuls abroad endeavor to limit the issuance of exchange visitor visas to foreign medical graduates who can speak understandable English.

Certification Services

The foreign medical graduate who has had his credentials successfully evaluated by the E. C. F. M. G. and passed its American Medical Qualification Examination and its test of proficiency in English is given an E. C. F. M. G. certificate. It is the hope of the four sponsoring agencies that the E. C. F. M. G. certificate will be accepted by hospitals, state boards of medical examiners, and specialty boards as evidence that the holder, though a graduate of a foreign medical school, is the possessor of medical knowledge comparable to that possessed by current graduates of our United States medical schools.

Report of Progress to Date

Letters of enquiry to the E. C. F. M. G. are rapidly increasing as it becomes known that informational materials are readily available. Nearly 300 foreign medical graduates had their credentials evaluated successfully and took the first American Medical Qualification Examination as given in 17 United States medical schools on March 25, 1958. Fifty-one per cent attained a score of 75% or more. Approximately 1,200 additional foreign medical graduates have applications in various stages of completion for the second American Medical Qualification Examination to be given Sept. 23, 1958, in approximately 20 United States medical schools and more than 30 medical schools in foreign countries.

Fourteen state boards of medical examiners and three specialty boards have acted to recognize the E. C. F. M. G. certificate based on its three-way appraisal of foreign medical graduates. The A. M. A. Council on Medical Education and Hospitals and the Association of American Medical Colleges have voted to withdraw their list of foreign medical schools (whose graduates were recommended for consideration on the same basis as graduates of American medical schools) on Jan. 1, 1960. After that date graduates of any medical schools outside the United States, Canada, and Puerto Rico will be expected to attain E. C. F. M. G. certification before applying for an exchange visitor visa and before being granted an appointment as an intern or a resident in a United States hospital. Many hospitals and one of our largest clinics are aiming to have all foreign medical graduates on their staffs certified by Jan. 1, 1960.

Summary

The Educational Council for Foreign Medical Graduates (E. C. F. M. G.) has been carefully planned and established by the four organizations in the United States which are most closely concerned with the maintenance of high standards of medical education and service. It has equipped itself to provide information to foreign medical graduates on request, to translate and evaluate foreign educational credentials, and to test the foreign medical graduate's command of English and his basic knowledge of medicine. It is rapidly completing arrangements whereby the English test and the American Medical Qualification Examination will be given in their own home country to foreign medical graduates whose credentials have been submitted and found meeting minimal requirements.

Every effort is being made to see that the informational phase precedes by a suitable time interval the evaluative and certifying phases of the program. With that important objective in mind, the E. C. F. M. G. has set the target date for the full functioning of the program (with all foreign medical graduates being properly certified before being granted United States exchange visitor or student visas and all foreign medical graduates on staffs of American hospitals being properly certified) as Jan. 1, 1960.

1710 Orrington Ave.

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LABORATORY ANALYSIS OF 1957-1958 INFLUENZA OUTBREAK (A/JAPAN) IN NEW YORK CITY

I. PRELIMINARY REPORT ON SEROEPIDEMIOLOGIC INVESTIGATION AND VARIANT A/JAPAN ISOLATE

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The biphasic nature of the 1957-1958 influenza epidemic and its contribution to the mortality during those years are revealed by data obtained in New York City. Hemagglutination-inhibition (HI) tests for Asian influenza were carried out from Sept. 16, 1957, to Feb. 21, 1958, on 2,719 serums negative for syphilis. The percentage of persons with HI antibodies positive to the NYC/1/57 influenza virus increased abruptly from a low figure to about 35% during October; the increase coincided with a first wave of deaths in excess of the normal seasonal expectation. The percentage of serologically positive persons showed a second abrupt increase in January, again simultaneous with an excessive mortality for the time of year. Between the two waves there was a period of quiescence of approximately two months. In January, 1958, a strain of virus was isolated that differed markedly from all previously tested strains, and three more strains of the new type were isolated in February. These facts suggest the possibility that older strains may become altered, or re-emerge after the lapse of years, or somehow recombine the antigens of earlier with those of more recent strains.

The influenza-pneumonia mortality data for New York City during the current (1957-1958) influenza outbreak can be divided so as to indicate the following four distinct phases: (1) a period of normalcy, which ended on Oct. 4, 1957; (2) a sharp rise between Oct. 4 and Oct. 18, 1957, decreasing to normal by Nov. 29; (3) a second period of normalcy between Nov. 29, 1957, and Jan. 10, 1958; and (4) a second rise in mortality starting Jan. 17, 1958, and extending through February (see figure). Similar influenza-pneumonia mortality curves have been reported for the whole United States, with no explanation available for the second rise in mortality.[1]

This paper will report seroepidemiologic results associating the increase in influenza-pneumonia mortality, including that of the second mortality wave, with the influenza virus. In addition, this preliminary report will describe the appearance of a variant of the Asian strain, coincident with the second rise in the mortality curve.

Method

Serum Collection.—Beginning on Sept. 16, and at weekly intervals thereafter, at least 300 negative serums per week were collected at random from the syphilis serology laboratory. The serums were stored in the deep-freeze unit until tested. The syphilis serology laboratory receives from 2,000 to 3,500 specimens per day. There is no obvious bias in the collection of these specimens with respect to the racial, geographical, or economic status of the patient. Tables 1 and 2 indicate the distribution of the serums used in this experiment, the reason for obtaining specimens in this laboratory (i. e., diagnosis or premarital or prenatal tests for syphilis), and age distribution of patients from whom serums were obtained.

Hemagglutination-Inhibition Test.—The Asian virus strain used in the hemagglutination-inhibition (HI) tests was the third (E3) or fourth (E4) egg passage of NYC/1/57 (typed as similar to A/Asian/Japan/305/57 by the Respiratory Disease Unit, Virus and Rickettsia Section, Communicable Disease Center, U. S. Public Health Service). The NYC/1/57 virus was isolated by this laboratory in August, 1957, from the throat washing of a New York City patient (Inga). The PR8, FM_1, and Lee viruses were old laboratory strains maintained by egg passage.

The standard pattern test was employed with use of four units of untreated virus.[2] The serums were treated with potassium periodate, inactivated at 56 C for 30 minutes and screen tested 1:8 (original dilution) for the NYC/1/57 virus and 1:16 (original dilution) for the PR8, FM_1, and Lee viruses. About 200 of the 300 individual specimens collected weekly were tested each week.

Results

An examination of the figure reveals the close relation between influenza-pneumonia mortality and the cumulative incidence of individuals with Asian

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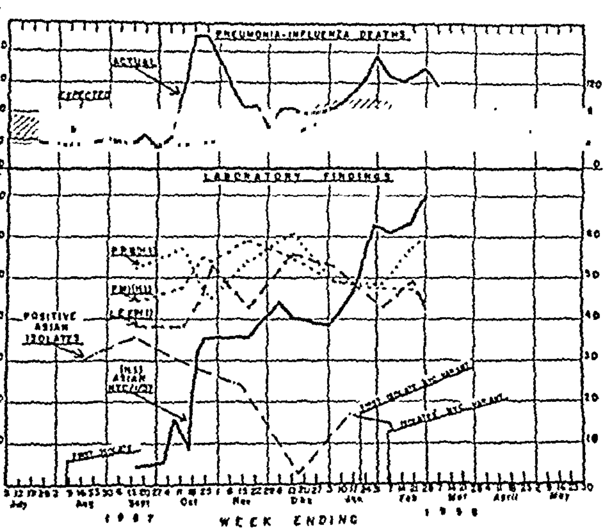
antibodies. The HI curve may be divided as follows into the same four phases as the mortality curve.

1. A low percentage of individuals with HI antibodies positive to the NYC/1/57 virus corresponding to the period of normalcy in the influenza-pneumonia mortality curve. During this period the virus began to disseminate throughout the New York City population. The virus was first recognized in New York City after its isolation from specimens obtained from foreign exchange students on Aug. 6, 1957, and by the end of August it was found in New York City residents. Between Sept. 16 and Oct. 4, about 4.5% of the serum collected in the serology laboratory reacted with the Asian virus.

2. A sharp rise to 35% of the population tested with the Asian strain, ending about Oct. 25. The similarity to the influenza-pneumonia mortality curve is evident (see figure). Worthy of mention is the fact that within a three-day period, Oct. 16-18, the curve rose from 10 to 33% HI positives. The explosive nature of the outbreak during these three days is also evidenced by the sharp rise in the mortality curve.



Correlation of laboratory findings and pneumonia-influenza mortality in New York City, 1957-1958. Total numbers of monthly virus-isolation tests made from August, 1957, through February, 1958, were 30, 84, 217, 38, 84, 90, and 84 respectively; of these, 30.0, 35.7, 29.0, 24.0, 2.7, 17.7, and 15.5% were positive. For HI tests, about 200 individual serum specimens were tested each week.

3. A relatively normal period (Oct. 21 to Jan. 10) during which time there was little significant change in the percentage of individuals reacting to the Asian virus. The variation during this period rose only between 36 and 42%, showing the consistency of the method. It will be noted that the mortality curve quickly became normal and remained so until about Jan. 10.

4. The fourth phase of the influenza-pneumonia mortality curve is characterized by the second rise in number of deaths, starting about Jan. 10 and extending through the month of February. This second rise occurred not only in New York City but throughout the nation.

The second rise in influenza-pneumonia deaths coincided exactly with the increase in the percentage of individuals with positive reactions which rose from about 40% on Jan. 3 to 70% on Feb. 28.

Table 1.—*Hemagglutination-Inhibition Test for Asian Influenza on Routine Specimens Submitted to Syphilis Serology Laboratory Between Sept. 16, 1957, and Feb. 21, 1958, in New York City*

Reason for Submission of Specimen to Laboratory	Total*	Positive	
		No.	%
For diagnosis	1,380	489	35.4
Premarital test	781	296	37.9
Prenatal test	555	148	26.6
Total	2,716	933	34.4

* Total New York City population, ages 15 and over, is 5,969,000

This second increase in both the mortality and HI antibody curves extended over a longer period than the initial rise which occurred in October.

It may be noted that throughout the testing period the FM$_1$, PR8, and Lee antibodies fluctuated between 40 and 60% without showing any definite trend. No significant statistical differences were found in the groups of serums submitted for either diagnosis or premarital tests for syphilis. There was a smaller percentage of positives in the prenatal group. It is of interest to note (table 2) that on final analysis all age groups were equally infected by the virus. Further study will be required to determine if this holds true for each period of the epidemic.

Virus Isolations

Results of throat washings and autopsy material submitted to the laboratory for influenza virus isolation may be seen in the figure. There is a close relationship between the percentage of positive isolates for Asian virus and the mortality and Asian HI curves.

Table 2.—*Age Distribution and Results (Asian Influenza) of Hemagglutination-Inhibition Test for Specimens Tested in Table 1*

Age	Total	Positive	
		No.	%
15-19	319	103	32.3
20-29	1,124	393	35.0
30-39	556	178	32.0
40-49	334	121	36.2
50-59	227	82	36.1
>60	147	56	38.0
No age given	12	3	...
Total	2,719	936	34.4

From August through October, 1957, about 30% of the specimens submitted for virus isolation were positive. The proportion of positives dropped to

2.7% in December coincident with other evidence of disappearance of the epidemic disease. The proportion of positives rose to 18% with the second wave.

New York City Variant

During the period Jan. 10 through the month of February, in which the second rise took place in both the HI and mortality curves, a variant of the A/Japan virus was isolated from the throat washings of four individuals by the egg inoculation technique.

In table 3 it will be noted that strains isolated early in the epidemic had no detectable antigenic relationship to FM$_1$ and in this sense were typical of strains isolated elsewhere. On Jan. 21, 1958, a strain was isolated which differs markedly from all previously tested strains in that it cross-reacted strongly with FM$_1$ serums as well as showing the ısual titer against anti-Asian serums. Three more trains of this new type were isolated between 'eb. 6 and Feb. 28. However, the majority of trains (11 out of 15) isolated in the second wave vere of the early type. The number of isolations is oo small to accurately determine the prevalence of he new type in the second wave. (Since this)aper was written, a similar finding was reported n a letter to the editor in *Virology.*[3])

TABLE 3.—*Demonstration of Isolates Inhibited by Both A/Japan and FM$_1$ Antiserums (Chicken) Hemagglutination-Inhibition Test*

Isolate	Date Specimen Submitted to Laboratory	Virus Type*														
		NYC/1/57						FM$_1$						Lee		
		25	50	100	200	400	800	25	50	100	200	400	800	50	100	200
Patients...............	1/21/58	I	I	I	I	A	A	I	I	I	I	A	A	A	A	A
	2/ 6/58	I	I	I	I	A	A	I	I	I	I	A	A	A	A	A
	2/ 7/58	I	I	I	I	A	A	I	I	I	A	A	A	A	A	A
	2/ 7/58	I	I	I	I	A	A	I	I	I	I	A	A	A	A	A
)ontrols..............	2/ 5/58	I	I	I	I	A	A	A	A	A	A	A	A	A	A	A
	2/ 5/58	I	I	I	I	A	A	A	A	A	A	A	A	A	A	A
	2/ 5/58	I	I	I	I	A	A	A	A	A	A	A	A	A	A	A
NYC/1/57 Virus	...	I	I	I	I	A	A	A	A	A	A	A	A	...	...	...
'M$_1$ Virus	...	A	A	A	A	A	A	I	I	I	I	I	I	...	...	...

* Numbers represent reciprocals of original dilutions. I = inhibition; A = agglutination.

When the new strains were tested against human erums the results were consistent with the anti;enic pattern demonstrated in table 3. Serums vhich contained antibodies against either FM$_1$ lone or NYC/1/57 alone also reacted strongly vithin the new variant.

Summary

The influenza epidemic which was current hroughout the United States in 1957 and 1958 was ınusual in that the etiological agent contained anti;ens for which most people in the population had ıo antibodies. This provided a unique opportunity o measure the prevalence of the disease in the population by determination of the presence or absence of antibodies to the new virus in single serum specimens in large samples of the population. As shown in the figure, about 35% of individuals in New York City were infected by this new virus in the initial wave of the disease. This part of the epidemic was widely recognized both by the medical profession and by the public. The initial wave was followed by a period of quiescence for approximately two months, during which time no significant number of new infections occurred. After this there was a second sharp rise in the percentage of reacting individuals. Characteristically this second wave was also accompanied by an increase in the total mortality in New York City. The curve shown in the figure suggests that the excess mortality was a reflection of a widespread dissemination of the virus.

Of equal interest is the isolation of four new strains of influenza virus which possess antigens characteristic of the influenza strains which were prevalent from 1947 through 1956. This is all the more noticeable since the earlier and most widespread of the strains involved in the current epidemic did not possess these antigens. One possibility which should be considered is that of recombination between the antigens of the earlier and the more recent strains.

Mr. Louis Pincus, Bureau of Records and Statistics, Department of Health, gave statistical assistance in this study. All data concerning the influenza-pneumonia mortality were supplied by the Bureau of Records and Statistics.

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TEACHING OF UROLOGY TO MEDICAL STUDENTS

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The threat to adequate instruction in urology in medical schools lies not so much in the depredations by curriculum-planning committees as they allot additional hours to rival courses as in lethargy and lack of perspective seen in occasional departments of urology. The best remedy is a balanced, meaningful course. The course here described is given in the third and fourth years. It consists of didactic lectures, ward-work with hospital inpatients and outpatients, demonstrations, and "spot seminars." The goals of the course must be explicitly delineated beforehand; the student's time must be conserved; and he must be impressed by a sense of forward movement of the program. The instructor's time likewise must be conserved. A detailed program which leaves nothing to chance, to faults of memory, or to later argument eliminates an enormous quantity of lost motion. This involves the early preparation of a "Urologic Instructor's Manual" and the development of teaching techniques that challenge the student's interest. Since teaching and research are both important, thought must be given to the need for recruiting to the urologic residency training program those students who have talent for either basic or clinical research. It appears that the most urgent need is not a greater share of the medical student's time but a more effective use of it by the departments concerned.

Problems relating to the teaching of urology to medical students have received increasing attention at the most recent meetings of the American Urological Association. This interest is reflected in the report of its committee to study the status of the undergraduate teaching of urology in the medical schools.[1] The stimulus for this survey was provided by the wish of the association to determine whether there was any factual basis to justify the expressions of worried concern from some quarters to the effect that the undergraduate teaching of the surgical specialties, including urology, was being seriously compromised. The growing curriculum pressures generated by attempts to crowd more and more subject matter into the rigid four-year medical school course were considered primarily responsible. At some schools, sharp curtailments in the time allotted to the teaching of urology to medical students had been effected. Dark prophecies had been made that the undergraduate teaching of urology would soon become a matter of history.

After the completion of a detailed survey of the teaching curriculums of the medical schools and of the attitudes of the responsible administrative authorities and chiefs of the urologic services of these institutions, the committee reported that "at 87% of the institutions surveyed, the urological services still have reasonable opportunities to present creditable and well-balanced courses to undergraduates, despite recent concessions." It minimized the extent of the dangers and the threats that the undergraduate teaching of urology might soon become extinct. Of much greater concern to this fact-finding body was the character and quality of the teaching programs already in operation. What appeared to be most needed was not a greater share of the medical student's time but a more effective use of the time already devoted to urology in most of the curriculums. "The time has come for every urologic instructor to take critical inventory and concentrate on that subject matter which promises to be most useful to students, irrespective of their ultimate type of practice. It is also imperative that every urologic instructor exercise rational introspection regarding how well he has really accepted his teaching responsibilities and how conscientiously he has tried to provide the best instruction of which he is capable."

Survey Results

Principally, the results of the survey indicated that in many of the institutions studied there existed a need for reappraisal of the efforts being made to teach urology to medical students and for reorganization of the scope and content of such courses; the greatest threat to the continuation of effective undergraduate urologic instruction was not from predatory external forces but from a lack of perspective, lethargy, and indifference to the needs of students in those charged with the responsibility for their instruction in urology. The integrity of a well-balanced and meaningful course in urology was to be regarded as its best safeguard against depredation by curriculum-planning committees on the hunt for additional hours to supplement the time allottment of more vigorous programs.

Early in its study, the committee recognized the difficulties involved in attempting a comparative appraisal of the teaching methods and programs

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now in use in American medical schools. These were too varied and too full of intangibles to permit statistical break-down and analysis. For the same reasons, it is almost impossible to develop even a useful idealized conception of a teaching program in urology adaptable to all medical schools. Significant differences in the sizes of classes, the clinical facilities, the diversification, volume, and character of the clinical material available to the uses of the teaching program, and the availability of capable urologists willing to spare the time from their private practices for teaching, are all factors that modify the usefulness of a pretailored program in any one medical school. Of even more fundamental importance are the variations in the basic philosophies regarding the objectives of the undergraduate teaching of this surgical specialty subscribed to by the responsible administrative authorities and the surgical department chairmen concerned.

To overcome the handicaps imposed by these variables and complexities, the committee suggested the development of a forum of some type in which those interested in and concerned with the problems of urologic education at the undergraduate level might meet for a mutually beneficial interchange of ideas. It proposed that a definite allocation of time be made at the annual meetings of the American Urological Association and that this be devoted to either a panel discussion or a symposium on the subject of undergraduate urologic teaching "where authoritative opinions could be aired, teaching methods compared, and projects for the future proposed." This suggestion was responsible for the preparation of an exhibit shown at the 1957 Annual Meeting of the American Urological Association entitled "The Undergraduate Teaching Program in Urology at the Baylor University College of Medicine." What follows is an expository description of the program based on the material contained in this exhibit.

In order to permit even admittedly superficial comparisons, some background is necessary. The Baylor University College of Medicine is a privately supported medical school located in Houston, Texas, an urban community of about one million people. Both the medical school and the Texas Medical Center of which it is a part have been located in Houston less than 20 years. It has problems in common with many young medical schools, and the traditions that develop with age and the support that accrues from a large body of loyal and devoted alumni have yet to develop fully. Four of the eight major hospitals (one a city-county hospital for indigents and another a 1,500-bed Veterans Administration hospital) are directly affiliated with the school, and the urologic services of two of the others are indirectly affiliated through an agreement between Baylor and the Postgraduate School of the University of Texas. At last count, there were 45 urologists in the Houston area, and of these, more than 50% are on the clinical faculty in urology of the medical school. All are either certified or eligible for certification by the American Board of Urology, at least the latter being a prerequisite for appointment to the faculty. Within this last year, a full-time instructor who had just completed his residency was appointed to the faculty.

Those who have participated in the program to be described concede its effectiveness. For two successive years, the graduating classes have designated their course in urology as the best organized, most effectively presented, and best taught course of the clinical years. For two successive years, the senior classes have awarded a bronze plaque to a urologic instructor as the so-called doctor of the year. Ten per cent of the seniors of the most recent graduating class professed sufficient interest in urologic residency training to have indicated this choice in the class yearbook. The instructors have been uniformly enthusiastic since the program has been designed to permit the individual instructor to make his contribution to the teaching effort with a minimum waste of time. A feeling of mutual respect pervades all of the sessions and has been most rewarding to those responsible for the planning of the program. Finally, the chairman of the department of surgery has responded to suggestions of the last senior class that the teaching program be reinforced at the third year level for increased effectiveness. At present, urologic instruction in the junior year consists of eight didactic lectures followed by an additional 16 hours of ward-work with hospital inpatients, demonstrations, and "spot seminars." Earlier, this instruction had consisted only of eight disjointed didactic lectures by as many different lecturers presented during one quarter.

Fundamental Objectives

A precise delineation of goals is indispensable in the development of a teaching program such as the one to be described, since all subsequent efforts are directed toward their attainment. The basic goal is to provide the medical student with an understanding of the principles of urology that are thought essential to his development as a well-rounded physician: it is not to make of him a physician who is either a competent urologist or a general practitioner capable of dealing competently with all urologic problems. It is recognized that for most medical students, their contact with urology during the clinical years in medical school may well be all they will have with the specialty before entering the private practice of medicine. Despite this, emphasis is placed on the orientation of the student in urologic disease mechanisms, and the distinction between teaching and training is clearly drawn. Training is a graduate discipline: it is an extension of the educational process to the residency level. Here the resident, because of his special interest, not only broadens his base of understanding of the principles of urology but acquires familiarity, dexterity, and competence in the techniques peculiar to urology.

A second objective is the most judicious employment of the time allotted to the division of urology for its teaching effort. If this is done, the student soon becomes aware of the precision with which the program has been planned and of its resultant sense of forward movement. Similarly, the instructor wastes no time, since his teaching assignment is clearly demarcated although no restrictions are placed on his ingenuity as a teacher within the boundaries of his assignment. In consequence of this, absenteeism on the part of both students and faculty alike has been remarkably low, an added tribute. Our experience has been that a carefully planned program carried forward by instructors who are completely familiar with its over-all objectives as well as their individual responsibilities to its successful implementation results in a student body that responds with interest and enthusiasm.

A third consideration is that of keeping the demands on the individual instructor's time at the minimum consistent with first-rate performance. This is especially important since the introduction of the four-quarter system, which makes necessary the repetition of the teaching effort at least four times during the academic year. In this connection, it is appropriate to quote again from the report of the committee to study the status of the undergraduate teaching of urology in the medical schools:[1] "Since urological teaching in 65% of the schools is still dependent on part-time and volunteer instructors, it seems naive to insist upon changes that demand more and more time of those individuals who find it difficult to do justice to prevailing programs." Here again, it has been our experience that a well-balanced and effective teaching program that utilizes the services of the teaching staff to the best possible advantage actually reduces the demands made upon the time of the volunteer instructors.

Finally, since teaching is only one of the functions of a division of urology, some thought must be given to the need for recruiting to the urologic residency training programs those students who show significant promise in basic research or as future clinician-investigators. If the educational experiences of the students in undergraduate urology have been made meaningful, there need be no shortage of candidates for vacancies in the residency training programs of the institutions at which these experiences were provided, nor need these vacancies be filled by candidates with less than adequate basic preparation.

The Urologic Instructor's Manual

Our experience has indicated the following lines of approach in the development of an effective teaching program for medical students. First is the projection of a clear picture of the program as a whole, with the objectives kept always in view. Second is the delineation in as much detail as possible of the component parts of the program to insure its smooth and efficient operation. Third, and of paramount importance, is committing the entire detailed program to writing, leaving nothing to chance, to faults of memory, and to later argument. Through the medium of a written program, what may amount to an enormous quantity of lost motion is eliminated. Both the students and the instructors know when and where they are to meet and what the subject matter of the session is to be by referring to their printed schedules. If preliminary preparation of an assignment is required of the student in the interest of making the class and group sessions more meaningful, this is a matter of written record with which the student has been provided before the course begins. Knowing well in advance what the subject is to be, the instructor arrives "primed" for his class. The urologic resident, as a member of the teaching faculty, knows well in advance what teaching aids and clinical materials will be required by the instructor and is charged by the instructor with the responsibility for providing them. Overlap and repetition are avoided: duplication of effort is eliminated. The student is soon aware that preventable absences are not without cost to him, and absenteeism is no longer the problem it used to be when the student felt that he was getting little in return for his time.

At least one month before the beginning of the school year, the division of urology prepares a multigraphed "Urologic Instructor's Manual," which is distributed to all members of the teaching faculty. This is enclosed in a sturdy and easily distinguishable binder that is appropriately labeled to prevent its being accidentally discarded with the voluminous pharmaceutical literature that arrives daily in the doctor's mail. The first sheet in the manual is a covering letter that summarizes objectively the teaching efforts of the division of urology for the year just closed and the program changes together with the reasons for such changes for the academic year about to begin. The remainder of the manual contains detailed faculty assignments with descriptive course outlines, student schedules, student section lists, and all other information considered pertinent. Not only is this effort worthwhile, it is considered to be the bone and sinew that holds the program together and gives it a sense of direction.

Instructors with major assignments, meeting with groups of 20 or more students for didactic lectures or conferences, are provided with pictorial rosters of the students assigned to them, permitting quick identification of the student from his photograph. These are usually made up for other reasons by the school's department of visual education and are readily procurable. They are of real value from the viewpoint of student psychology, since the student is no longer "the second man from the left in the third row." He is now an individual whose identity is known and whose performance becomes intensely personal. The student reacts favorably, too, to vhat he believes to be a manifestation of personal nterest.

Provided with such a manual, the instructor nows at least one month in advance what the total eaching effort is to be and that his own assignnent is an important integral part of that effort. A ignificant sense of individual responsibility is inpired. During the past two years, instructors have one to considerable effort to avoid failures to meet vith their classes, although the procedure by which he instructor can obtain a substitute is clearly tipulated. The effects produced establishes a benecial cycle: the students, responding with interest nd enthusiasm, stimulate the instructor to even ner performance.

Student Performance and Examinations

Precise mathematical grading for the evaluation f student accomplishment seems to serve little urpose at the senior year level. The compilation f grades for whatever reasons a grade average is equired is usually made at the end of the junior ear and has since served its purpose. Although the eniors are quizzed frequently at weekly sessions nd are given both a written final examination as ell as an oral final quiz, these are intended priarily as teaching exercises. The so-called written nal examination is truly more of an exercise and nsists of 200 questions of the true-or-false, fill-in, multiple-choice types. These are multigraphed d distributed to the seniors in brochure form at e last session of the quarter in which the work in rology has been completed. The students are alwed to take the examination questions home for period of 72 hours, and they are permitted to fer to any textbook or class notes for help in swering the questions. Only one stipulation is ade: that each student sign a statement on the ce-sheet of the exercise to the effect that he has mpleted it solely as a result of his own efforts. It pointed out that a group effort serves only to efeat or minimize the principal aim of the exnination, which is self-education.

Each of these questions incorporates a point nsidered important to the urologic orientation the physician. Each is thought to be a pinchaft from which the student extends his knowledge urology. The avidity with which medical students ok for information in capsule form, or as "nuggets" "pearls," as they are popularly termed, is well own.

The completed examinations, when returned, are graded quickly by a secretary employing a master copy on which acceptable answers are marked. They are subsequently used as the basis for examination of the students individually during the final oral quiz. The final oral examinations are two hours long and are given to groups of five or six students on an evening some weeks after completion of the course. Since the class is composed of 16 such groups, an additional 32 hours is required of the teaching staff. This is considered a pleasant assignment by most members of the faculty.

At this oral examination, the emphasis remains on teaching, and not on the evaluation of the students for accomplishment or retentiveness. Gross specimens demonstrating readily apparent diseases of the genitourinary organs, borrowed from the department of pathology, and interesting urologic roentgenograms showing classic disease patterns are also used for the purposes of this examination. Hypothetical case presentations are used to develop in the student the capacity for understanding the genesis and mechanisms of urologic disease. In such cases, the correct diagnosis is only part of the answer: the student must be able to justify his diagnosis through analysis of the given symptoms and findings. Students have not found the oral examination to be a traumatic experience. On the contrary, these sessions rarely end without a spontaneous expression of appreciation from the students for the interest and effort of the instructors.

The students' interest in clinical urology is maintained throughout the junior and senior years by the annual award of two prizes that have been established by members of the teaching faculty to honor distinguished urologists. The first is given to that senior student demonstrating the greatest aptitude for the interpretation of urologic roentgenograms; the second prize, to that senior who during the course of his clinical years first makes the diagnosis of early carcinoma of the prostate, subsequently proved, by rectal-digital palpation. In both instances, the prizes are standard sets of urologic reference books.

Undergraduate Urologic Teaching and Research and Clinical Investigation

Teaching and clinical investigation and research are two of the vital primary functions of the medical school. The two have an immediate reciprocal relationship and soon become inextricably intertwined. The inquiring minds of properly stimulated students, fresh and possibly naïve in their approaches to new spheres of knowledge, are a constant challenge to the validity of traditionally accepted ideas, methods, and techniques. The conscientious teacher, stimulated to a continuing critical reexamination of his subject matter, inevitably finds himself in blind alleys as a result of the significant gaps in his knowledge of which he now becomes aware. The truism that "he who teaches also learns" tends to vitiate the criticism that a program such as has been described has little value because it is stereotyped, for the good teacher finds his material in a state of constant change. If he has an attitude of critical open-mindedness, and possesses exacting habits of thought, clear-cut educational ideals, and a genuine enthusiasm for learning, he assiduously strives to find rational substitutes for empiricism and dogma. This very frequently leads him to productive investigation and continuing scholarship, so necessary to the vigor of any field of medicine.

The medical student is similarly stimulated by the good teacher, and the gadfly in today's senior class may tomorrow be one of the most prolific of the investigators in urology if given the proper encouragement. It is the duty of the good teacher to nurture in his students the restless spirit of inquiry that seeks to find answers where as yet there are none. A well-ordered undergraduate teaching program is basically necessary to the development of this spirit in the medical student.

Summary and Conclusions

In its effort to determine the degree to which the continued undergraduate teaching of urology in medical schools was being threatened, as had been claimed in some quarters, the committee to study the status of the undergraduate teaching of urology in the medical schools of the American Urological Association conducted an intensive survey.[1] Its findings indicated that the greatest dangers to the present status of urologic instruction in the curriculum were to be found within the teaching programs of the specialty of many of the institutions studied. Reorganization for more effective utilization of the time allotted and of the services of the voluntary teaching staff and reappraisal of the scope and content of the courses as presently being taught were recommended. The urologic teaching program for the medical students of the Baylor University College of Medicine was developed in response to these suggestions and has been in operation for more than two years. Its effectiveness is measurable in some degree by the interest expressed by 10% of the last senior class in residency training in urology following the internship. Precise programming has resulted in a well-ordered teaching effort that has employed the time allotted in the curriculum to the study of this surgical specialty to the best possible advantage and has reduced the demands upon the limited time of the members of the voluntary teaching faculty. Its development and its effectiveness are thought to be contingent upon the projection of a clear picture of the program as a whole, bearing in mind the objectives to be attained, delineation in as much detail as possible of the component parts of the program to insure its smooth and efficient operation, and commitment of the entire program, in detail, to writing in the "Urologic Instructor's Manual," which is distributed to the individual members of the faculty well in advance of the beginning of the academic year.

1813 the Medical Towers (25).

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MOUTH DISORDERS IN THE AGED.—The care of chronic mouth disorders in the loosely defined group referred to as the aged has often been one of shifting responsibility to either the dental profession or the otolaryngologist. . . . Every patient complaining over a considerable period of time of a sore mouth and burning tongue merits at least a complete differential blood count and urine examination to apprehend pernicious anemia, leukemia, syphilis or diabetes, if present. Less often miliary gumma may indicate a complete serological survey and a single lesion a biopsy. Most of the conditions are more annoying and disturbing than serious. If the patient's complaints are not given thorough consideration but are just glossed over with, "There's really nothing wrong with your mouth," he can become a mental problem. One of the most common and distressing complaints is the "burning tongue." . . . Vitamin deficiencies may produce not only a burning tongue but also a general stomatitis. . . . Geographic tongue is more frightening to the patient than organically injurious. . . . The scrotal tongue is a harmless, deeply fissured tongue. . . . Senescence also presents changes in the oral cavity comparable to those observed in other tissues in the body. . . . The therapy suggested has been successful in the hands of the writer and is presented for consideration. The geriatric patient requires sympathetic understanding and patience.—C. M. Epsteen, M.D., D.D.S., Chronic Refractory Mouth Disorders in the Aged, Symposium on Difficult Office Problems, *The Medical Clinics of North America*, March, 1958.

REPORT OF LARGE-SCALE FIELD TRIAL OF JET INJECTION IN IMMUNIZATION FOR INFLUENZA

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The need of giving hypodermic injections to thousands of people became acute during a service-wide campaign for immunization against influenza. Experience with 20,145 injections by a jet method is here described. It involves the use of a machine capable of generating pressures between 135 and 150 atmospheres (2,000 to 2,200 lb. per square inch). For the injection the tip of the jet nozzle is held firmly against the skin over the relaxed deltoid muscle. The machine is completely mobile except that it requires a source of electricity. As many as 734 injections were given per hour. Problems of technique were readily solved, and asepsis was easily maintained. The antibody responses of 52 subjects who received influenza vaccine by jet injection were compared with the responses of 27 subjects inoculated by needle and syringe, and there was no significant difference in the results. The new technique made it possible to give injections to large numbers of people rapidly, safely, simply, and with minimal psychological trauma.

When the military services adopted a service-wide influenza immunization campaign, the magnitude of the problem presented at a large naval air station in sterilizing individual syringes and needles for more than 10,000 individuals assumed staggering proportions from the medical manpower, man-hours, and available equipment standpoint. Accordingly, arrangements were made and approved by both services to utilize the Presso jet machine and to conduct the largest scale field trial of jet injections yet attempted. We conducted the field trial at the Naval Air Station, Norfolk, Va., with the two available machines from the Walter Reed Army Medical Research Institute.

The machine is essentially a two-stage hydraulic system. The first stage consists of an electric hydraulic pump which forces fluid at pressures of 2,000 to 2,200 lb. per square inch into a hydraulic cylinder in the handle of the gun. This force cocks a heavy spring which transmits its energy into the second hydraulic system, which is the vaccine system. The dual hydraulic system and spring combination is engineered to avoid dangers of contamination of the injected material with hydraulic fluid. In the instrument used, the vaccine system can be removed easily for sterilization. The unit can then be reassembled in sterile condition in approximately 90 seconds. The equipment is completely mobile and is dependent for operation solely on the availability of electricity. The machine is cocked in approximately three and one-half seconds by pressure on the bottom trigger, and the tip of the jet nozzle is then held firmly against the relaxed muscle of the deltoid. The vaccine is injected in four-tenths of a second by squeezing on the top or firing trigger.

Our experience in 20,145 injections in 1955 and 1956 has substantiated the concept that the use of the jet inoculation technique with a multiple-dose unit is feasible and extremely effective as a method of mass inoculation. Indeed, in our series the primary difficulty was to process recording data, prepare the skin, and then present the subjects to the operator rapidly enough to effect complete utilization of the machine.

Table 1 indicates the record of the number of inoculations per hour. It will be observed that the rate of injections increased somewhat with familiarity of the operators with the machines in 1955, and in 1956 mechanical improvements of the instrument markedly increased the potential injection rate per hour.

Procedure

After a short period of instruction, the inoculations were administered by personnel previously untrained in jet-injection technique. The "shots" were administered to personnel in hangars, in quonset huts, and aboard ships; the only equipment necessary was the jet units, vaccine, an instrument sterilizer, and acetone-saturated cotton balls. The inoculation team consisted of one medical officer, two hospital corpsmen, and two nontechnical assistants. Sterilization of the vaccine system was effected and the equipment set up within one hour prior to beginning inoculations. Essential data for recording was written by the subject on a 3-by-5-in. card and presented to a member of the team at the head of the line of subjects. The line was supervised by a hospital corpsman who cleansed the skin over the deltoid area and vectored the subjects to

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the machine operator. All personnel were observed by a trained hospital corpsman for bleeding after the inoculation and instructed to apply pressure if bleeding should ensue. Sufficient time was allowed between skin cleansing and the injection to permit drying of the skin.

Table 1.—*Inoculation Data*[*]

Group		No. Injected	Guns Used, No.	Time, Hr.	Injections/Hr.
1955	1	547	2	1	273
	2	638	2	1	319
	3	1,154	2	1 5/6	320
1957	4	197	1	1/3	537
	5	1,236	1	2 1/3	537
	6	731	1	1	731

[*] The volume injected was 1 ml. in all cases.

The vaccine, a preparation of formalinized extra-embryonic chick embryo fluid, contained equal parts of Swine and FM1 strain of influenza A and the Great Lakes strain of influenza B.

Skin preparation at the onset of the series consisted of cleansing the skin over the muscular area of the deltoid with cotton ball sponges saturated with ether. The rapid evaporation of the ether was advantageous in that it presented a dry area of skin to the machine operator. It proved to be disadvantageous in that the sponges dried very rapidly when prepared in large numbers, the fumes from the ether presented a fire hazard in confined spaces, particularly in shipboard areas, and it was drying to the skin of the assistant assigned the detail of skin preparations. The majority of skin preparation was done with acetone which evaporated rapidly enough to permit drying of the skin and yet did not present as dangerous a fire hazard as ether fumes. It also was less productive of skin-drying of the assistant's hands.

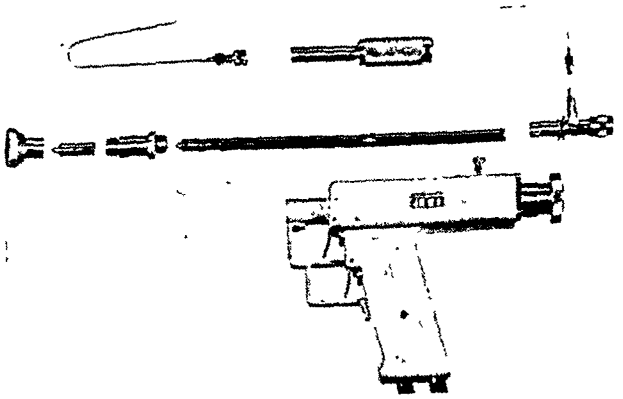
One hospitalman member of the team was utilized to draw blood samples on one man out of each 50 to provide immunological data which will be presented elsewhere in this paper. A preinoculation blood sample and a three-week postinoculation blood sample was thus obtained on 2% of the subjects, and immunization titers were run to demonstrate effectiveness of the jet gun from this standpoint.

Recording of data into the individual health record of the subjects was accomplished after the series was completed with use of the 3-by-5 cards which were collected in the line. The team member to whom these slips were given inquired as to the subject's sensitivity to eggs, feathers, or chickens to avoid inoculating those individuals known to have a definite allergic manifestation.

Mechanical Difficulties

A detailed description of the construction and operation of the machine used was presented by Warren and others in 1955.[1] A photograph of the disassembled injection handle of the gun is shown in the figure.

The high hydraulic pressures encountered throughout the unit will produce leaks in either the oil or vaccine systems with minor defects in the hydraulic "O" rings. Defects developing in the "O" rings in the oil hydraulic system are the most difficult to remedy because replacement of the defective ring necessitates a press or "C" clamp to retain the high spring tension during removal of the retaining screws and removal of the spring in order to obtain access to the hydraulic cylinder. These "O" rings can be replaced in a unit in about an hour. Minor leaks occur in the neoprene "O" rings in the two trigger assemblies and could be replaced in about 10 minutes. None of the above repairs required resterilization of the vaccine systems. Leaks which occurred in the "front" and "rear" vaccine "O" rings, requiring replacement of the "O" rings, required resterilization of the vaccine system prior to resuming activity. These rings could be replaced in a few seconds, and the unit was resterilized, reassembled, and ready for use within 10 minutes. This explains the need for a ready boiling sterilizer to minimize delays. Another mechanical difficulty encountered is a plugged jet nozzle. This will be encountered with increasing frequency as the size of the aggregate particles in the injected solution approach the diameter of the jet nozzle or 0.005 in. The plugged jet nozzle can be removed under aseptic conditions by removal of the nose assembly, removing the defective nozzle with an alcohol impregnated sponge. A previously autoclaved jet nozzle is then replaced under aseptic technique, the nose assembly replaced, and operation resumed. This latter operation can be completed in 60 to 90 seconds. A supply of spare jet nozzles in a sterile glass container was always kept available. There is one area in which leaks may develop that will suspend operations and require considerable equipment to effect repair. The failure of the ball check valve in the forward end of the plunger system to seat properly causes the gun to deliver less than the measured dosage and requires a metal lathe to gain access to the ball valve. Another ball valve is located at the rear of the plunger assembly and, if improper seating occurs, will allow vaccine to be returned to the reservoir on each injection. How-



Disassembled injection handle of jet injector.

ever, this latter valve is easily accessible. These latter two mechanical failures are the most difficult of perception and made it mandatory to keep a rough count of the number of "shots" per vial of vaccine in order to obtain data regarding accuracy of dosage administered.

The diagnosis and correction of the mechanical difficulties which may occur is relatively simple. First, leak of vaccine from the tip of the gun during firing, a defect which may occur once in 3,000 to 7,000 shots, is due to a worn front "O" ring. This ring is readily replaced, but the procedure usually equires resterilization of the vaccine system.

Second, leakage of hydraulic fluid from the dosge calibration window indicates an internal "O" ing defect. This is a rare occurrence, and replacenent of this component can be done in approxinately 15 minutes. Third, failure to prime or loss f priming during operation is due to plugged entilation of vaccine supply needles (which must e cleaned or replaced) or to rear "O" ring leakge. The latter occurs but rarely, in less than 8,000 o 10,000 shots, and is remedied by replacing the O" ring.

Fourth, failure to obtain penetration may be due o loss of priming or to a plugged jet nozzle. The ozzles can be promptly replaced aseptically. Selfocking of the gun or failure to remain cocked inicates a defective trigger "O" ring which must be eplaced.

Fifth, an operational error may arise if injections re made beyond the emptying of the vaccine vial. n this event, foam will appear on the skin and e gum must be reprimed with vaccine. It is imossible to inject air.

Clinical evaluation of the jet injection technique as assessed by observation for bleeding from the te of injection, pain of injection, and acceptability y patients, and special note was made of the enronmental effects on penetration and the relationip of race and muscularity of the subject on peneation.

Warren and co-workers reports as a disadvange of the method the high incidence of minor eeding from the site of injection in 15% of subcts inoculated. In our series there was an incidence only 2-3% of bleeding of any consequence. Rounely with the jet-injection technique, within five conds after inoculation there is a slight droplet ooze of vaccinosanguinous material from the site injection. It is admitted that the amount of bleedg in this 2-3% is slightly more extensive than that en with needle inoculations and that the bleeding more likely to continue for a longer period of me, but close scrutiny of the subjects for bleeding ter inoculation and a minimal amount of pressure plied by the subject was an adequate measure r control in all instances. Unfortunately, the magtude of the program prohibited close observation r ecchymosis, but no subcutaneous hematomas of sufficient size to require the subject to seek medical care were seen during the course of 20,145 inoculations.

A disadvantage is possible laceration of the skin [2] if the nozzle moves during the inoculation cycle. This was observed in only four cases in our series. The lacerations were not completely through the skin, were less than 0.25 in. in length, and required no special therapy other than application of an adhesive bandage. Injury due to accidental misfire occurred in this series when one operator succeeded in forming an epidermal wheal 1 cm. wide the length of his finger. No untoward effects other than the immediate pain of the vaccine appeared in this case during several days' observation. No other accidents were attributed to this method of administration. No infections were observed to develop at injection site in any recipients of jet injection.

Degree and intensity of pain unfortunately are most difficult to analyze from the patient standpoint, and the evaluation of the machine from the pain standpoint was further impeded by the painful reaction from the vaccine. The vaccine used was a suspension of formalin-killed organisms, and subjective response to the pain of the injected formalin did not permit an accurate evaluation of the injector because, being new, all symptoms, to the layman, were attributed to the method of administration and not to the vaccine. It is important to note, however, that complaints of pain were never registered for approximately 20-30 seconds after the inoculation. Admittedly, the injection with the jet technique is not a completely painless procedure, but pain is definitely less than that experienced with the needle and syringe method. Many subjects remarked that the pain was similar to a single pin prick felt in the multiple pressure method of smallpox vaccinations. In one shipboard trial, 20 of the subjects who experienced excessive pain volunteered to take a jet injection with isotonic sodium chloride solution; all uniformly admitted no pain from this injection. As a matter of fact, one subject, when injected with saline solution, insisted that the machine was not operating properly until he was shown four droplets of vaccinosanguinous fluid exuding from the areas in which four separate 1-cc. doses of the saline solution had been injected.

In the study of apprehension, it is interesting to note that there were no episodes of syncope prior to receipt of the inoculations in the entire series of 20,145 inoculations. This is a most important point from the standpoint of the psychological response and patient-acceptability to jet injection. The epidemicity of fainting in an inoculation line is a well-known hazard to all who have participated in mass immunization programs. In this series, there were but two episodes of syncope in the immediate post-inoculation period. One instance was of an enlisted WAVE who was menstruating at the time, which may have contributed to her circulatory instability. The absence of needles to penetrate the skin with the jet injection method appears to be definitely reassuring to juveniles and adults as well.

At the beginning of the test, there was definite apprehension that environmental conditions would affect the percentage of good penetrations and cause a greater number of dermal wheals. It was assumed that the tenseness of skin produced by the chilly atmosphere of a large aircraft hangar would interfere with penetration, but this was definitely disproved. If one single factor is to be pointed out which affects penetration, it is the state of dryness of skin. Apparently the changes in surface tension brought about by a wet skin adversely affect penetration. In our series, on the first day we observed epidermal wheals among 10-15% of the first 300 subjects until it was discovered quite by accident that the incidence of wheals was less when the area to be injected was perfectly dry. With a dry skin area the incidence of epidermal wheals is less than 1%.

It has been mentioned that failure of penetration is more common in heavily muscled men. In our experience, a prerequisite of good penetration is a completely relaxed extremity, and in patients in whom complete muscle relaxation could be obtained no differences in penetration were noted, even in heavily muscled individuals. As our program progressed and as this effect became apparent, it became routine to insist on complete relaxation and a completely dry arm. Using these measures, as many as 350 inoculations were given without a failure of penetration. No differences were noted in age or in the various races and nationalities encountered in our series, which included Caucasian, Negroid, Malayan, Polynesian, and Mongolian.

TABLE 2.—*Antibody Response to Jet-Injected Influenza Vaccine in 52 Adult Males (Nov., 1955)**

Response	Method of Inoculation			
	Jet		Needle	
	No.	%	No.	%
Titer rise	38	73	8	29
No rise in titer	14	27	19	71
Total	52		27	

Vaccine: FMI—E5M51 ⅓
Swine—M38E30 ⅓
Great Lakes—E4M10E10 ⅓

* Chick cell agglutination titer of vaccine, 750. Equal parts of Swine and FMI strain of A virus and Great Lakes strain of B virus were used.

In any immunization procedure, antibody response must be demonstrable if the technique is to be regarded as effective. Earlier studies[3] have shown that certain vaccines, notably typhoid, are antigenically as effective when jet injected as they are with conventional needle injection. A total of 52 preinoculation and three-week postinoculation serum pairs were collected at random from jet-inoculated personnel, and 27 individuals who received the vaccine by needle and syringe were similarly bled for comparison of antibody formation. Table 2 demonstrates antibody titer comparison between serums from jet and needle injected individuals.

Out of 52 jet-injected individuals, 38 (73%) showed a titer rise to one or more of the component antigens in the vaccine, while 14 (27%) showed no rise. In the needle-vaccinated controls, the proportion of the individuals with rises in titer were lower than that for jet injection.

Of the 38 individuals with rises in titer after jet injection of vaccine, 30 had a fourfold or greater rise in titer. The control serum from needle-injected men showed a lower order of response. It may be concluded that the jet injection technique produces an immune response at least equivalent to that of the conventional needle and syringe.

Summary and Conclusions

A recently developed instrument for rapid semiautomatic, multiple dose mass injection has been field-tested with the two largest groups as yet undertaken. Immunological data have been collected to demonstrate a comparable response to vaccine received with jet injection to that with needle and syringe injection. The jet-injection technique is of potential value in large-scale immunization programs in military and civilian disaster and potentially in modern warfare in the treatment of mass casualties. Jet injection of influenza vaccine induces antibody response favorably comparable to that produced by needle and syringe injection.

The advantages of the injector unit include the following factors. The equipment can be used in any location, is easily transportable, and depends solely upon the availability of electricity, which could be supplied by a portable generator for field use. Sterilization facilities and amounts of equipment for care of masses of people are minimal. The dangers of transmittal of hepatitis, malaria, and syphilis are absent. This is of particular importance in hepatitis. Large groups of subjects may be injected rapidly, safely, simply, and relatively painlessly with minimal psychological trauma and by relatively untrained personnel. Maintenance of equipment is quite feasible with a minimal amount of training.

However, the injected material must be nonviscous and in aqueous solution, and the size of the aggregate particles must be less than 0.005 in. in diameter. The machine is still in the development stage.

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EVALUATION OF A PROGRAM TO IMPROVE TEACHING OF CANCER IN MEDICAL SCHOOLS

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The teaching program to stimulate interest and increase the knowledge of cancer has fulfilled the following objectives: new methods of analysis of medical teaching effectiveness systematically explored on a national basis in order to attempt to document quantitatively the results of the cancer teaching program; improved cancer learning as evidenced by the results of the annual examination on the subject of cancer learning, from 1949-1957; additional teaching personnel whose main interest is in cancer added to the medical school faculty; the establishment of new research facilities; aid to other existing laboratories with expansion of their facilities; increased postgraduate instruction in neoplastic diseases; the establishment of student fellowships; and more people made aware of the magnitude of cancer and its impact on the human race.

This is an analysis of the impact and results of a teaching program inaugurated in 1947 for undergraduate medical students, to stimulate interest and increase the knowledge of cancer. This report is based on a review of all grant applications to the United States Public Health Service and on questionnaires sent to senior faculty members not directly connected with the programs, to medical students, and to faculty members directly in charge of the programs, designated as "coordinators of cancer teaching."

After a conference of the National Advisory Cancer Council in 1946, a committee on cancer, composed of 22 deans and professors from 14 medical schools and other representatives, was appointed for the purpose of improving methods of teaching cancer in medical schools.[1] After a meeting on Nov. 7, 1946, the committee made the following recommendations: (1) that the dean and faculty of each medical school be asked to review the present method of teaching cancer in their school; (2) that if an integrated course in cancer is not already given, the school consider introducing a program of instruction, preferably in the senior year, in which the pathology, physiology, and biochemistry of cancer are correlated with a weekly clinic devoted to the presentation of cancer of various sites; (3) that they undertake to stimulate cancer research in their school, since it is recognized that research improves teaching and stimulates student interest; (4) that copies of this report be made available to all medical schools and others interested in medical education in cancer; and (5) that the United States Public Health Service consider ways and means of providing necessary financial assistance to interested medical schools prepared to undertake an integrated program of teaching cancer; that the Public Health Service also try to interest other agencies in giving financial support to such a program. A subsidy of approximately $10,000 to $25,000 annually for a period of years was suggested. The amount to be granted to an individual school would depend upon the demonstrated need. This subsidy might not be adequate to cover the entire cost of the program in many institutions. However, it was believed that in such event the school sufficiently interested might secure additional funds from other sources.

In June of 1947, the National Cancer Institute, with the approval of Congress, undertook a program of grants to coordinate the teaching of cancer in approved medical schools. The intent of the program was not to train specialists in oncology but rather to interest all students of medicine in acquiring a knowledge of cancer and learning known and new techniques of diagnosis and treatment. This program has been reviewed on several occasions,[2] but at the 1956 meeting of the cancer coordinators a committee of coordinators was appointed to review the program and present the results of the study to the general medical profession in THE JOURNAL of the American Medical Association.

Since 1947, when appropriations were first made available, a total of 78 four-year medical schools have received grants of up to $25,000 annually, and six two-year schools have received grants up to $5,000 annually. This amounted to a total of $2,021,887 in grants awarded for the year 1956-1957. It has been the policy of the Public Health Service for each school to formulate its own program according to its needs and the local situation. The programs have varied widely from vertical teaching plans in which students devote a specified time entirely to the study of cancer to horizontal pro-

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grams which have attempted to improve cancer teaching in all phases of the curriculum. Many schools have adopted combination plans with elective or prescribed courses in different phases of cancer. Eight schools have established separate departments on oncology. A member of one of the major departments is usually designated as coordinator of the teaching program. Coordinators of the cancer teaching programs are widely distributed in various teaching disciplines with 39% in surgery, 27% in pathology, 11% in medicine, and 10% in oncology. The remaining 13% are distributed in radiology, anatomy, and gynecology.

Early in the program monies were used for equipment, but by 1956-1957 over 80% of funds were expended for personnel. The salaries of 268 professional medical school teachers and 236 nonprofessional medical school employees have been provided by these grants. Sixteen schools use a part of these funds for student research fellowships and 35 use them for visiting lecturers.

TABLE 1.—*Tabulation of Questionnaires Sent to Senior Faculty Members Not Associated with Cancer Teaching Program in Medical Schools, 1957*

	Pathology		Medicine		Surgery		Radiology		Anatomy	
Replies, no.	37		40		37		35		22	
Schools replying	33		35		33		33		21	
Able to evaluate	32		37		36		33		11	
	Yes, %	No, %	Yes, %	No, %	Yes, %	No, %	Yes, %	No, %	Yes, %	No, %
Improved cancer teaching	90	...	97	3	100	0	100	0	100	0
Improved cancer diagnosis	87	...	97	3	86	8	90	...	36	...
Improved cancer therapy	68	3.1	91	5	75	19	93	...	36	...
Improved cancer research	65	15	78	19	77	11	63	21	91	...
Improved postgraduate education	62	15	81	5	71	16	72	6	36	18
Improved lay cancer education	60	21	48	21	58	22	42	12	54	...
Adversely affected curriculum	6	90	...	100	3	91	3	93	9	81
Favorably affected curriculum	65	15	51	35	60	30	45	24	81	9
Attracted participation teachers from other departments	90	3	86	5	91	3	81	3	72	...
Coordinator helpful	50	12	78	3	75	3	81	3	91	...

As reported in Congress in 1953, the sum of 12 billion dollars is lost each year as a result of incapacitation to the family breadwinner from cancer. An estimate of the hospital cost to each cancer patient was $535 with an additional cost of $350 for physicians' services, for a total of $885. If a teaching program can reduce this loss of productivity and the period of hospitalization, it will more than justify its expense.

Faculty, Student, and Coordinator Questionnaires

Different questionnaires were sent to faculty members, medical students, and coordinators of cancer teaching and returned separately and anonymously to this committee. Some facts have been collected, but results are reported mainly as opinion since so many different teaching techniques h been employed and situations vary so markedly t specific comparison would be invalid.

Questionnaires were sent to the heads of departments of 63 medical schools whose coo nators of cancer teaching had previously retur questionnaires. Four of these departments wo normally be expected to engage in the teaching cancer, but one subclinical department, nam anatomy, was quizzed in order to ascertain effect of the program in an area not commo associated with cancer teaching. A total of faculty questionnaires were sent, and 171 were turned. One hundred forty-nine of the 171 reply felt able to evaluate some part of the program (of replies). Replies were predominantly favora and are summarized in table 1. It is of note five of the faculty members felt that the progr affected the curriculum adversely (3.4%). Facu opinions concerning the most valuable contri tions of the cancer teaching programs in order frequency mentioned are professional person teaching equipment, tumor clinic, tumor regis nonprofessional personnel, research equipm student fellowships, and visiting lecturers.

Questionnaires were returned from 61 se medical students in 31 medical colleges. Stude were selected in most instances who were pr dents of their class, and again their answers are the most part opinion rather than fact. Eighty- per cent believed cancer had been well taught their school. Eighty-six per cent felt that the result was an influence which had stimulated in est in the cancer problem in their class.

Questionnaires were sent to the coordinators cancer teaching in 78 four-year and 6 two-y medical schools. Sixty-three schools (75%) retur answers. Several of the coordinators who did answer replied that they were unable to answer questions or give figures because of the nature their programs. Several two-year schools felt program was too new for evaluation in their p ticular schools.

Ninety-five per cent of coordinators answeri felt that cancer education had improved as a res of these grants. Eighty-five per cent felt that can diagnosis had improved and 81% felt that thera had improved in their institutions. Three, or 5. of the coordinators felt that they had been ha pered in the establishment of a program because lack of cooperation of senior faculty members antipathy to the program.

The teaching grants have provided aid for exi ing cancer diagnostic and cancer research labor tories in many schools. It has aided in the establis ment of new cancer research facilities and tum registries and has assisted other departments, suc as medical arts, audiovisual, and other teaching ai (table 2). In addition, 12 cancer research labor tories, 9 tumor registries, 6 medical arts or audiovisual departments, and 3 tissue culture laboratories have been established.

It is difficult to establish a true cost of cancer teaching, but 46 schools reported that an average of $31,618 per school was spent yearly in addition to the cancer teaching grants. Because of personnel provided by the teaching grants many schools were able to secure additional research grants; in 32 schools this amounted to an average of $50,400 per school and compares to an average of $229,000 per school spent on cancer research in 50 schools which had no relation to the teaching grants. In a group of 25 of the smaller medical colleges with average annual budgets of slightly over 1 million dollars, it was ascertained that 14.4% of the budget was spent on cancer research and teaching and that 18% of cancer research funds have been brought to these schools because of the teaching grants.

TABLE 2.—*Effect of Cancer Teaching Grants on Laboratory and Clinic Facilities in Sixty-three Four-year Medical Schools*

Type of Facility	New	Aided	No Effect or Not Stated
Tumor clinic	22	31	10
Cytology laboratory	27	8	28
Isotope laboratory	22	6	35
Cancer detection center	13	7	43

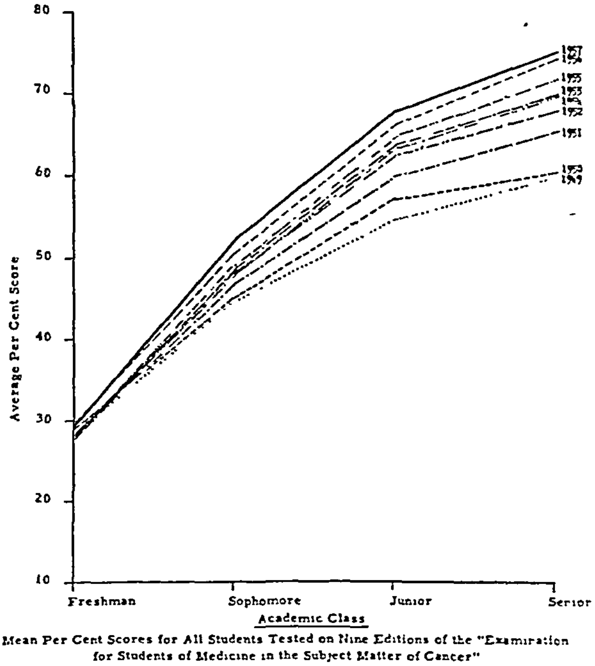
Questions were asked concerning the type of cancer teaching program established, 75% of replies indicated a program which was chiefly clinical, only 7.4% indicated a predominantly research program, but 62% of replies stated that an attempt was made to balance the program between research and teaching. Twenty-three per cent of the coordinators felt that research was a necessary part of a cancer teaching program. The majority of coordinators replying to questions concerning lay teaching in the community considered this to be a part of their duties, this being a part of the crusade against cancer. Nine out of 10 coordinators participated in postgraduate as well as undergraduate medical instruction.

The number of patients seen in tumor clinics was estimated in 34 schools for two two-year periods. Prior to the grants in 1946-1948, 33,952 patients were seen in organized tumor clinics in 28 schools. In 1954-1956, 71,544 patients were seen in 34 organized clinics. Six schools did not have tumor clinics prior to 1949. Thirty-two schools reported that students had become interested in cancer research during the 10-year grant period, as there was an average of 12 students per school who became interested in choosing cancer research as a career as a result of the cancer teaching program.

Cancer Learning Examination

Perhaps the most significant yardstick of the value of the cancer teaching programs was established at the University of California in 1949. Bierman and McClelland[3] formulated and administered the first interschool annual examination in the subject matter of cancer through an education project. Results of this examination were later evaluated by Towner and Galloway,[4] and more recently this project has been conducted and evaluated by Wood and associates[5] and Loret and West.[6] The examination, which is revised annually, consists of 150 multiple-choice questions on the subject matter of cancer. The test is broad in its coverage of neoplastic disease, attempting to cover the diagnosis, biological characteristics, and treatment of all types of cancer.

The education project supplied each school with two sets of results: first, the individual scores of students and, secondly, a comparison of the performance of individual schools including national averages and a breakdown of results into categories by site, diagnosis, characteristics, and treatment. This allowed each school to determine the relative strengths and weaknesses of cancer learning and teaching in that school. The examination has been given to 137,578 medical students since its inception and is given annually in April throughout the country in most medical schools.



Results of cancer learning examination over nine-year period.

In the figure, the results of the examination for nine years are summarized. In every year except 1954, the results at graduation have improved. The greatest increase in knowledge of cancer occurs in the second year, which is the conventional period when students are instructed in pathology, and, of course, oncology. The increment of learning for the senior student has improved 17% from 1949-

1957, as indicated by the average per cent score. This examination is the only interschool examination which permits a valid comparison of different teaching techniques and curricular methods. National and State Board examinations are of necessity selective in varying degrees. A number of studies of this examination have been completed,[7] and others are in progress which add to our knowledge of the value of teaching methods in other phases of medicine as well as cancer.

Comment

It is apparent from the above-mentioned effects of the cancer teaching programs that much has been accomplished in pursuit of the objectives set up by the National Advisory Council in 1947. There is no question but that funds appropriated have aided many schools in developing or expanding a subdepartment concerned primarily with the cancer problem in teaching, in research, or in service to patients. This has tended to offset the centrifugal acceleration of teaching of specialized medical disciplines required for cancer diagnosis and therapy by developing a compensatory centripetal teaching element which aids the student by organizing and correlating the work of these specialties so that a better look may be obtained at the entire problem of the patients.

As far as can be determined the teaching program has fulfilled the following objectives: new methods of analysis of medical teaching effectiveness systematically explored on a national basis in order to attempt to document quantitatively the results of the cancer teaching program; improved cancer learning as evidenced by the results of the annual examination on the subject of cancer learning, from 1949-1957; additional teaching personnel whose main interest is in cancer added to the medical school faculty; the establishment of new research facilities; aid to other existing laboratories with expansion of their facilities; increased postgraduate instruction in neoplastic diseases; the establishment of student fellowships; and more people made aware of the magnitude of cancer and its impact on the human race.

The complete lack of stereotyped teaching programs is remarkable and emphasizes the major role played by medical schools in adapting these programs to their needs. An eventual lowering of cancer mortality is the ultimate goal of any cancer teaching program, and perhaps this program has been one of the contributory factors that has resulted in the earlier diagnosis and lowered death rate of cancer of the cervix that has been reported in a number of areas in this country. While the program is of value to the large medical schools, its greatest contribution has been to the smaller, less well-endowed schools. It has provided personnel who can attract cancer research funds that otherwise would go elsewhere. Some of these research units have become self-sustaining because of their scientific contribution.

The grant program is a potent reminder of the unsolved nature of the cancer problem and the continual need to graduate physicians who are highly motivated and trained to accomplish the utmost cancer control with existing techniques and tools. Epidemiologic and statistical evidence points to an increased importance of neoplastic disease as a cause of death, and it is entirely possible that the prevention of cancer may in the long run be a more practical achievement than the chemotherapeutic cure which is desperately sought. The instruction of the medical student in this area leaves much to be desired. Instruction in cancer cannot be isolated or delegated to specialized instruction and hospitals. Good medical teaching with an increased emphasis on the protean character of cancer, its cause, diagnosis, and treatment, is possible and has been realized to an appreciable degree in all of the cancer teaching programs analyzed.

Albany Medical College, New Scotland Avenue (Dr. Olson).

This study was prepared by a committee of coordinators of cancer teaching appointed in June, 1956, with Dr. Olson, chairman.

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VENTRICULAR ANEURYSM AFTER MYOCARDIAL INFARCTION

SURGICAL EXCISION WITH USE OF TEMPORARY CARDIOPULMONARY BYPASS

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A ventricular aneurysm developed after myocardial infarction in a 50-year-old man. It was large enough to cause a bizarre configuration of the heart shadow in chest roentgenograms and was found at thoracotomy to measure 10 cm. in diameter. Extracorporeal circulation, employing a bubble diffusion oxygenator and roller-type complete occlusion pumps, was established by inserting one catheter into the common iliac artery through the right common femoral artery and another catheter, with openings at two levels for the superior and inferior venae cavae, through the right common femoral vein. The adherent parietal pericardium was dissected from the surface of the aneurysm, and the aneurysm was then completely excised, with the edges trimmed back to the fuctioning myocardium of the left ventricle. Closure was made with a continuous suture of silk reinforced with interrupted mattress suture of silk, and the suture line was 10 cm. in length. The patient's early postoperative course was moderately complicated by fever, but after this subsided on the third day his recovery was uneventful. He was dismissed from the hospital in ambulatory condition 18 days after operation. Since this initial report, another patient with a similar lesion underwent operation successfully.

Improved methods of medical management have reduced the mortality in patients suffering an initial myocardial infarction to approximately 5%, and the majority of patients are able to resume relatively normal activity and return to work.[1] A significant number of patients who survive the initial attack, however, are permanently and seriously incapacitated, and in many instances death results from localized myocardial necrosis. Among the more lethal complications of myocardial infarction are (1) rupture of the ventricle, (2) rupture of the interventricular septum, (3) rupture of a papillary muscle, (4) mural thrombosis with embolization, and (5) ventricular aneurysm. In spite of the known poor prognosis in such cases, until recently these complications were treated only by supportive means and routine cardiac medication. Within the past few years, particularly with development of techniques of open-heart surgery, reconstruction of the heart severely damaged by myocardial infarction has become a reasonable consideration in an attempt to salvage such patients. Repair of interventricular septal defects after myocardial infarction has already been accomplished with use of a pump oxygenator for cardiopulmonary bypass.[2] Rupture of a papillary muscle after myocardial infarction has not been reported, but repair of such lesions produced by trauma or infection has been successful in our own patients. It was reasonable to expect that other complications of acute myocardial infarction would be operated upon by open cardiac techniques.

Ventricular aneurysm occurs in a significant number of patients surviving myocardial infarction—an incidence varying, according to reports, from 10 to 38% depending upon definition of the term.[3] Ventricular aneurysm may occur acutely during the first few days after infarction but usually appears weeks or several months later. Hypertension and failure to adhere to strict rules of convalescence are causative factors in development of ventricular aneurysm. The most common location for ventricular aneurysm is the anterior and apical portion of the left ventricle. Presence of the noncontractile sac in this location interferes with the ejectile force of the left ventricle. Pulsations that are paradoxical to the remainder of the ventricle are demonstrable fluoroscopically. Cardiac output may be sharply reduced. DeCamp,[4] for example, demonstrated in a patient with ventricular aneurysm a cardiac output of 1.6 liters per minute, whereas normal expected output for his patient was 4.0 liters per minute. Congestive heart failure was responsible for death in 70% of patients with ventricular aneurysm according to Schlichter and associates,[3] who studied 102 autopsied patients, and only 12% survived more than five years after the acute episode. Other causes of death in ventricular aneurysm include rupture of the aneurysm and embolic phenomena emanating from thrombosis in the noncontractile pouch.

In 1944 Beck[5] attempted to reinforce the sac of a ventricular aneurysm using fascia lata, but the patient died five weeks later from complications. Murray[6] subsequently reported experimental excision of myocardial infarcts and demonstrated an increase in cardiac output by removal of the "ex-

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pansion chamber." In 1951 tangential excision and lateral aortorrhaphy was first advocated as the procedure of choice for sacciform aneurysms of the thoracic aorta.[7] Since that time application of this concept of treatment to cardiac aneurysm has been attempted in isolated instances. Recently surgical treatment of ventricular aneurysm after myocardial infarction has been reported by Bailey and associates[8] in six patients, with five survivors. The technique consisted of tangential excision of the sac and ventriculorrhaphy, with use of a special clamp across the base of the lesion. Among the dangers associated with such a procedure when applied to the beating heart are dislodgement of mural thrombi and massive embolism, rupture of the base of the aneurysm produced by the clamp, and inaccurate excision of the damaged tissue resulting in impaired left ventricular function. Temporary cardiopulmonary bypass with use of a pump oxygenator appears to be a more rational approach to surgical repair of ventricular aneurysm, since it would obviate these potential hazards. The purpose of this report is to describe a case in which aneurysectomy and ventricular repair were successfully erformed with use of temporary cardiopulmonary bypass.

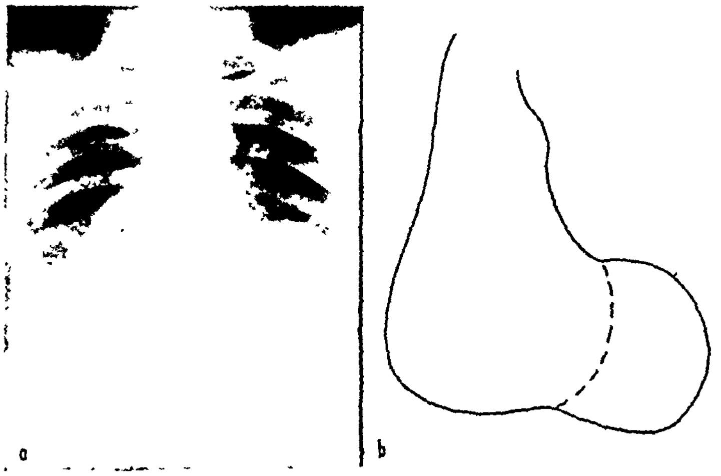

Fig. 1.—*A*, roentgenogram of chest in posteroanterior projection and, *B*, diagram showing abnormal cardiac contour produced by aneurysm of left ventricle.

Report of a Case

A 50-year-old man was admitted to the Methodist Hospital on Jan. 13, 1958, with dyspnea on exertion. Three months prior to admission he first experienced substernal pain and dyspnea, which occurred on each of two successive days. A diagnosis of myocardial infarction was made by electrocardiogram, and he was treated with bed rest for a period of 10 weeks. Shortly after the infarction congestive heart failure occurred, and digitalis was administered. Since the infarction he had experienced occasional precordial pain, which was relieved by sublingual nitroglycerin tablets. For the month before admission he had dyspnea after mild exertion, orthopnea, and occasional paroxysmal nocturnal dyspnea. Blood pressure stabilized at about 120/90 mm. Hg after the infarction, in contrast to a pressure of 170/100 mm. Hg a short time before the heart attack. Several years previously the systolic blood pressure had been recorded as high as 250 mm. Hg.

Physical examination on this admission revealed a moderately obese man in no distress. The heart was enlarged to the left anterior axillary line, and a systolic heave was present at the apex. No murmurs were audible. The lungs were clear, and the liver was not enlarged.

Laboratory studies revealed a hemoglobin level of 12 Gm.% and hematocrit of 38 vol.%. The remainder of the hemogram was normal, and urinalysis was normal. The electrocardiogram revealed an extensive anterior wall infarction, with persistent changes in ST segments in the precordial leads. Roentgenograms of the chest revealed a bizarre cardiac configuration and a significantly enlarged left ventricle with a bulbous apex suggestive of cardiac aneurysm (fig. 1). At fluoroscopy the ventricular aneurysm pulsated parodoxically to the pulsation of the left ventricle. Cardiac catheterization was not done.

On Jan. 17, 1958, with the patient under thiopental (Pentothal)-ether anesthesia, a bilateral anterior thoracotomy was performed, entering the fourth intercostal spaces and transecting the sternum at the same level. An apparent thrombosis of the left anterior descending coronary artery was noted approximately 2 cm. from its origin. An aneurysm 10 cm. in diameter was present in the anteroapical portion of the left ventricle (fig. 2). The parietal pericardium was adherent to the aneurysm, which expanded with each ventricular contraction.

Preparations were made for temporary cardiopulmonary bypass with a stainless steel bubble diffusion oxygenator and roller-type complete occlusion pumps.[9] A single vena caval catheter was used to withdraw blood from the superior and inferior venae cavae, inserting the catheter through the right common femoral vein (fig. 2). Another catheter was inserted through the right common femoral artery and threaded into the common iliac artery for return of oxygenated blood to the systemic circulation. The rate of flow in the extracorporeal circuit was 3,000 cc. per minute equivalent to 35 cm per kilogram of body weight per minute. Intermittent aortic occlusion was used throughout the period of total bypass to reduce coronary venous return to the heart.

With the bypass functioning, the adherent parietal pericardium was dissected from the surface of the aneurysm, and the aneurysm was entered at its apex. The aneurysmal wall was extremely thin, measuring about 3 mm. in thickness. The aneurysm was partially lined with laminated thrombus, which extended into the ventricular cavity. The sac was completely excised, with the edges trimmed back to the functioning left ventricular muscle. A small amount of laminated thrombus was removed from the left ventricular cavity. The resulting defect in the ventricular wall was repaired with a continuous suture of 000 black silk reinforced with multiple interrupted mattress sutures of silk. The ventricular suture line was 10 cm. long (fig. 2). Blood was permitted to fill the left ventricle as the myocardium was being sutured in order to eliminate air from the cavity, but in spite of this maneuver a small quantity of air entered the coronary system. Perfusion was continued with cautious use of phenylephrine (Neo-Synephrine) hydrochloride and epinephrine, and forceful ventricular action resumed. Although the pump oxygenator was in use for 32 minutes, total cardiopulmonary bypass was necessary for only 11 minutes. The pericardium was repaired and the thoracotomy closed, with use of intercostal tubes for subaqueous drainage.

The patient's early course after operation was complicated by fever and mental disorientation during the first few days. After the fever subsided on the third day his subsequent recovery was uneventful, and he was dismissed from the hospital 18 days after operation in ambulatory condition. His blood pressure at the time of dismissal was 130/80 mm. Hg. The patient has continued to improve and is progressively increasing his physical activity. He has noted a significant improvement over the status before operation.

Pathological examination of the excised specimen revealed a fibrous sac measuring 10 cm. in diameter containing a small amount of mural thrombus. Histological sections showed old and relatively recent thrombus, with loss of endocardium. Chronic and acute inflammation was evident within the underlying densely hyalinized fibrotic tissue. In some areas of the specimen striated anastomosing muscle of cardiac type was present containing nuclei that were barely discernible.

Comment

In this patient a major portion of the left ventricle was defunctionalized by an extensive myocardial infarction occurring three months previously. Impaired function of the remaining myocardium resulted, since with each systole the noncontractile sac ballooned outward, thus interfering with normal ventricular ejection. Furthermore, the amplitude of contraction of the normal myocardium was reduced by the presence of the nonfunctioning area. Once the structural abnormality was removed, restoration of the ventricle as a coordinated functional unit was accomplished and ventricular efficiency was improved.

Most ventricular aneurysms secondary to myocardial infarction are located on the anterior or apical portion of the left ventricle, a location that is favorable for excision. Bailey has emphasized the technical problems in ventricular aneurysmectomy, which include prevention of embolism from the sac during excision, secure approximation of the remaining ventricular wall after excision, and limitation of the extent of ventricular resection to an amount compatible with survival. His technique consisted of applying a clamp across the base of the lesion, excision of the redundant tissue, and repair of the ventricular margin. Such a method, although relatively satisfactory in his reported cases, does not provide an accurate means of excising the destroyed tissue and repairing the ventricle. Moreover, experimental studies have demonstrated that application of a "noncrushing" clamp to the ventricle produces full-thickness necrosis and scarring of the myocardium.[10] The technique of open repair, therefore, with use of cardiopulmonary bypass would obviate such complications and permit accurate excision of the sac, leaving only functioning myocardium, papillary muscles, and chordae tendineae of the mitral valve.

The technique of cannulation of the superior and inferior venae cavae by way of the common femoral vein used in this patient may be well suited to patients with myocardial infarction or other serious lesions. Presumably in a critically ill patient in congestive heart failure the cannulation of the venous and arterial systems could be performed with the patient under local anesthesia. Circulatory support could then be utilized even before general anesthesia is induced. In fact, the anesthetic agent could be introduced through the oxygenator while the patient's circulatory system is being supported. Once bypass is started and anesthesia induced the cardiac repair could be undertaken.

Summary

Ventricular aneurysm is a common complication of myocardial infarction. Serious disturbance in cardiac function may result, depending on extent of the lesion and other factors. Cardiac output is impaired by the noncontractile sac, which expands paradoxically while the remainder of the ventricle contracts. Congestive heart failure, cardiac rupture, and embolism emanating from intrasaccular thrombosis lead to high mortality in such cases.

Surgical excision of the sac should be considered in patients with ventricular aneurysm, particularly if cardiac function is impaired. In a 50-year-old man a large left ventricular aneurysm was successfully resected, with use of a pump oxygenator for cardiopulmonary bypass.

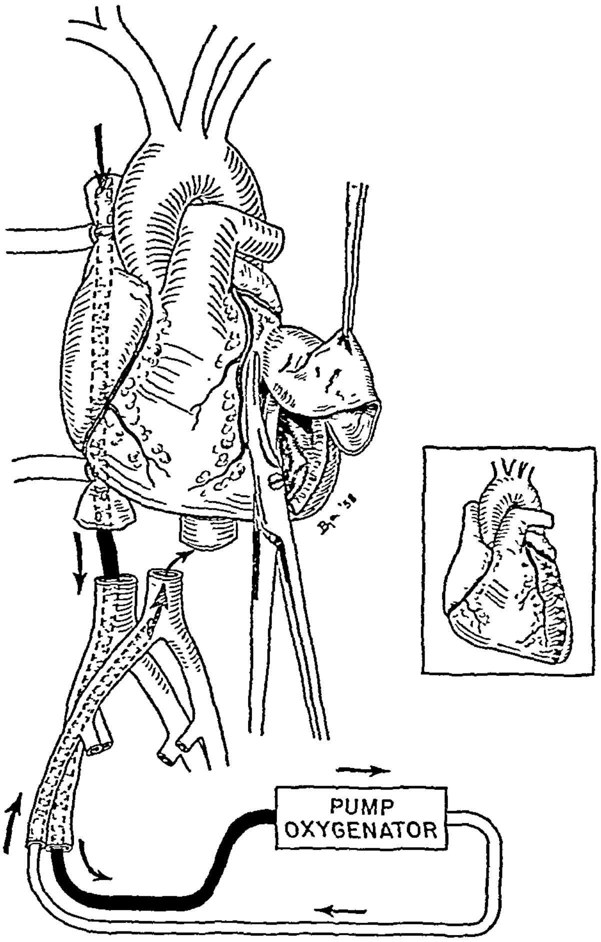

Fig. 2.—Technique used in excision of aneurysm and repair of left ventricle. Ventriculorrhaphy measured 10 cm. Cannulation of venae cavae through femoral vein and of common iliac artery through femoral artery facilitated performance of cardiopulmonary bypass in this patient.

Addendum

Since this paper was submitted a 48-year-old patient with massive left ventricular aneurysm was operated on successfully with use of temporary cardiopulmonary bypass. Cardiac catheterization studies were made before and five weeks after operation with the following results. Before operation the patient's pulmonary arterial pressure was 60/30 mm. Hg (mean 45); his right ventricular pressure was 60/0 mm. Hg (mean 45); and his cardiac index, at rest, was 1.6 liters per square meter per minute. After operation his pulmonary arterial pressure was 30/10 mm. Hg (mean 22); his right ventricular pressure was 25/0 mm. Hg (mean 15); and his cardiac index at rest and after exercise was 1.84 and 3.54 liters per square meter per minute respectively. These findings suggest an improved cardiac function and relief of left-sided stasis.

This study was supported in part by the C. J. Thibodeaux Foundation and the United States Public Health Service.

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THE LABORATORY DIAGNOSIS, BIOLOGY, AND TREATMENT OF LATENT SYPHILIS

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With the decrease of reported syphilis in the United States, and with this decrease being most marked in the early syphilis category, the proportion of latent syphilis to all syphilis has increased, since it is a chronic form of the disease. The necessity of differentiating the patient with latent syphilis from the BFP reactor becomes increasingly important, since both groups are relatively larger in our present population. Latent syphilis requires no more or no different treatment than does early syphilis. A total dosage of 4,800,000 units of procaine penicillin G in oil and aluminum monostearate or half of this amount of benzyathine penicillin G is adequate for both. It is not the goal to obtain seronegativity in the treatment of the patient with latent syphilis since seronegativity may or may not occur within the patient's lifetime. The TPI test is a better indicator of the immunological status of the luetic patient, after the test has once become reactive.

Latent syphilis is defined as that stage of the disease found in a patient who is asymptomatic, has a reactive blood serologic test for syphilis (STS), presents neither clinical nor other laboratory evidences of syphilis after thorough physical examination, and has a cerebrospinal fluid which, on examination, is completely negative. If the disease is of more than two but less than four years' duration, it is called early latent. If the disease is of four or more years' duration it is termed late latent. This is an arbitrary division based on potential infectiousness.

A physician who suspects a patient of having latent syphilis must also appreciate the possibility that he may have instead a biological false-positive (BFP) STS reaction if lipid antigens are used. The interpretation of such reactions is difficult, since the various modifications of the complement-fixation or flocculation tests may give BFP reactions in many types of nontreponemal diseases. In such

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Read before the 11th International Congress of Dermatology, Stockholm, July 31, 1957.

instances time rules out the acute BFP reaction, but the Treponema pallidum immobilization test (TPI) or a similar specific treponemal antigen test such as the Treponema pallidum complement-fixation test or Reiter Treponema complement-fixation test must be used to rule out the chronic BFP reaction. The diagnosis of latent syphilis is no longer entirely one of exclusion, but can now be proved by a combination of specific treponemal antigen tests, immunological studies, and the general course of the disease. With the decrease of syphilis in the United States (485,560 total cases in 1941 to 122,075 total cases in 1955),[1] and with this decrease being most marked in the early syphilis category, the proportion of latent syphilis to all syphilis has increased, since it is a chronic form of the disease. Likewise, if one assumes that the number of acute and chronic BFP reactors has remained constant, then the percentage of false-positive reactions in the positive STS group will be proportionately higher. Thus the necessity of differentiating the patient with latent syphilis from the BFP reactor becomes increasingly important, since both groups are relatively larger in our present population.

A study[2] of inoculation syphilis, in 62 human volunteers at Sing Sing prison, has shed important light on the immunological status of the patient who has had syphilis. Twenty-six patients who had been previously treated for proved or presumed late latent syphilis were inoculated intracutaneously with 100,000 virulent T. pallidum of the Nichols strain. Of the 26, 10 were either infected by the inoculum or had an immunological response to it, since they developed both lesions and a significant rise in STS titer. Only one of this group of 10 developed a darkfield positive lesion. One of the darkfield negative lesions was clinically a gumma. Apparently, immunity in some syphilitics is great enough to produce an Arthus-like phenomenon (a gumma) after a large challenge with virulent T. pallidum. However, in others, immunity is not adequate to protect against reinfection.

Three of the 26 patients developed darkfield negative lesions (small papules at the inoculation site) with no accompanying elevation in STS titer. The remaining 13 patients showed no change either clinically or serologically.

Five patients with untreated latent syphilis showed neither clinical nor serologic response after a similar inoculation of virulent spirochetes. They were resistant to superinfection and nonreactive immunologically to the inoculum given.

This study[2] further shows that those who have had a previous syphilitic infection may show an anamnestic or accelerated immunological response. The injection of heat-killed T. pallidum resulted in an anamnestic TPI antibody rise in certain individuals previously treated for early syphilis, but no change was noted in reagin titer. When a similar inoculum was administered to normal persons, no increase in TPI or reagin titers resulted. When the injected challenge consisted of living organisms, those patients who had had syphilis in the past showed a rise in the TPI antibody prior to a rise in reagin titer. The opposite response was observed when live spirochetes were injected into normal individuals who previously had not had syphilis. Reagin was detectable before TPI antibodies appeared.

For many years it has been known that previous infection, of sufficient duration, gives rise to some degree of resistance to further treponemal exposure.[3] The Sing Sing studies extended our knowledge of this fact by using the T. pallidum challenge as a method for measuring this immunity.

It has not been shown that reagin, which accounts for the reactivity of our common serologic tests, has any effect on the spirochete. It appears earlier in the blood than does the TPI antibody, but after the treatment of STS and TPI positive early syphilis, or of latent syphilis, the TPI test may remain positive long after the STS has become negative. The TPI test therefore is a better indicator of the immunological status of the luetic patient, after the test has once become reactive. However, we have had three instances of patients with late tabes dorsalis in whom both the blood and spinal fluid have been nonreactive with lipoidal and TPI antigens.

Many syphilologists believe, and Thomas has stated,[4] that latent syphilis requires no more or no different treatment than does early syphilis. A total dosage of 4,800,000 units of procaine penicillin G in oil and aluminum monostearate is adequate for both. It may be given intramuscularly in divided doses of 600,000 or 1,200,000 units each on a daily or a twice weekly schedule, until this total dosage has been reached. If longer acting penicillin preparations, such as benzathine penicillin G, are used, a dosage of 2,400,000 units is adequate. It is not the goal to obtain seronegativity in the treatment of the patient with latent syphilis since seronegativity may or may not occur within the patient's lifetime.[5]

Should serious sensitivities to penicillin be present, oxytetracycline hydrochloride or chlortetracycline hydrochloride may be employed, in amounts of 1 Gm. every six hours for 10 to 12 days, making a total dosage of 40-48 Gm.[4]

A recent report of the use of synnematin B in the treatment of a case of primary syphilis in a human and experimental syphilis in rabbits indicated that this antibiotic may represent another injectable compound which is less toxic and may be as effective as penicillin.[6]

If, during the observation of a patient with latent syphilis after treatment, the STS titer shows a sustained rise of two or more dilutions, retreatment may be necessary, but only after complete reevaluation of the disease in the patient. The development of signs or symptoms of active syphilis in a previously treated patient presumed to have had latent syphilis means either that a relapse has occurred or that the patient has sustained a reinfection or superinfection. In such instances retreatment is indicated.

If the results of Moore's[7] compilation of cooperative clinical group data concerning treated latent syphilis are compared with Bruusgaard's[8] data concerning untreated luetic patients, we are able to gauge the benefits afforded by treatment. Although the two sets of figures are not strictly comparable, since the treated cooperative clinical group was followed for 10 to 15 years, compared to Bruusgaard's longer period of observation, it is possible to arrive at some interesting conclusions. The proportion of patients achieving clinical quiescence and persistent seronegativity is increased from 35% in the untreated group to 85% in the treated series. Those showing clinical quiescence but persistent seroreactivity are reduced from 35 to 7.5% and the probability of progression or relapse is diminished from 20 to 30% to 2 to 5%.[9] Thus the gains to be made by treating the patient with latent syphilis are appreciable. The data on the cooperative clinical group[7] were obtained from the study of patients who had been treated with arsenicals and heavy metals. Undoubtedly, if penicillin had been used, the results would have been as good, if not better.

The treatment of latent syphilis is not different from that of early syphilis. Nothing is gained in attempting to reduce the STS reactivity by combined heavy metal–penicillin regimens or retreatment courses. The reagin has had several years to form, and regardless of treatment or retreatment will probably take several to many years to disappear. Late latent syphilis is now the most common, but least important, type of the disease, and undoubtedly would not require treatment (except possibly in pregnancy) if as clinicians we possessed sufficiently sensitive tools to differentiate between the patient who truly has latent syphilis and the one who has an asymptomatic form of the disease which later might become symptomatic. The biological false-positive reactor should no longer confuse the picture, since he can now be separated from the latent syphilis group by specific treponemal tests.

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THE SYMBOL OF MEDICINE.—The two important symbols that have emerged from serpent worship are the caduceus and the Aesculapian staff. Both have the staff or rod as its central object. . . . Mercury once separated with his wand two serpents twisted in mortal combat; thereafter he carried messages between enemies, and his wand became a badge of neutrality. . . . In 1856 the U. S. Marine Hospital Service, antecedent of the U. S. Public Health Service, was convinced that the caduceus best portrayed the non-combatant character of the medical corps. . . . Whether the true symbol of medicine is the caduceus or the Aesculapian rod is a question that has been the subject of argument over many years. . . . When a hospital or a sanitarium or a medical instrument firm or pharmaceutical company or a medical book printer ascribes to the symbol of Hermes, they ascribe to a symbol the meaning of which they may not have understood. If they understand by the symbol, earning of money, they may be correct. If they understand by the symbol, craft and cunning, this too may be their standard. If they understand by the symbol, neutrality, then they certainly err. Peacetime medicine is anything but neutral and modern war time medicine is certainly not neutral. Neutrality does not exist today. The weight of the evidence collected from mythology, archeology, anthropology, art, military science, literature, religion and heraldry confirm what has long been known, the fact that the true symbol of medicine is the Aesculapian rod, a single snake coiled about a staff.—Frederick Stenn, M.D., The Symbol of Medicine, *Quarterly Bulletin of Northwestern University Medical School*, Spring, 1958.

HEMOGLOBIN LEVEL AND RED BLOOD CELL COUNT FINDINGS IN NORMAL WOMEN

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Erythrocyte counts and determinations of hemoglobin concentration were carried out on blood samples obtained from three groups of women. There were 84 entirely free from complaints, symptoms, or positive physical or laboratory findings; a second group of 293, described as normal with physiological variants, were normal by anamnestic, physical, and laboratory criteria but had complaints ascribed to anxiety, tension, or fatigue. A third group of 286, described as normal with gynecologic variants, had complaints such as dysmenorrhea, menstrual irregularity, or menopausal symptoms although they were normal when objectively appraised. The red blood cell counts gave an average of 4,370,000 erythrocytes per cubic millimeter, with 95% of the women falling within the range from 3.81 to 5.03 million per cubic millimeter. The hemoglobin determinations gave an average of 12.55 Gm. of hemoglobin per 100 cc. of blood, with 95% of the women falling within the range from 10.2 to 14.8 Gm. per 100 cc. The values obtained for the gynecologic variant group were not significantly lower than the values for the first, asymptomatic group, and no effects of age were demonstrated. These results are important as reference figures in diagnosis and treatment, since it is futile to strive for values higher than the average in the treatment of supposed anemia. Both of these figures are lower than those generally quoted as normal in textbooks.

A mean hemoglobin level of 12.55 Gm. per 100 cc. and a mean red blood cell count of 4,370,000 per cubic millimeter were the findings we obtained when we statistically analyzed the data from the charts of 663 "normal" women. In an extensive search of the literature, we have been unable to find any reference to any similar clinical study. The accepted standards are 14 Gm. of hemoglobin per 100 cc. and 4,800,000 red blood cells per cubic millimeter.[1] In the opinion of an authority in the field of hematology, attempts to treat patients in order to raise their hemoglobin levels or red blood cell counts to certain so-called normal values may be not only wasteful but harmful.

Hematocrit reading, mean corpuscular volume, mean corpuscular hemoglobin, bone marrow studies, and/or blood studies in the isotope laboratory may be the coming methods of determining an anemic state, but, as yet, a drop of hemoglobin level and/or red blood cell count from the accepted standards is the recognized definition of anemia.[1a] Just as changing to the metric system in our prescription writing after 25 to 30 years is still in the process of being universally accepted, so will changing the definite standards of determining abnormal blood states take time. Laboratory acceptance, hospital requirements, blood bank prerequisites, pharmaceutical advertising pressure, and, most of all, established clinical usage assures a place for red blood cell count and hemoglobin determinations as clinical tools now and for quite some time.

In our private practice, when we have attempted to bring hemoglobin level and red blood cell count on women up to the previously established standards of 14 Gm. and 4,800,000,[2] we have too frequently failed. Complete histories and physical examinations frequently would be normal and other laboratory procedures within the allowable normal range, but the red blood cell count would probably be 500,000 less and hemoglobin level 1 to 2 Gm. less than the standards quoted. Changes in diet and medication have been ineffective. Consultations have added nothing. It has been most frustrating.

Consequently, we began to question the accepted standard of normal. Review of the literature is disconcerting. The original normal figures were determined nearly a century ago by the results of only four blood cell counts.[1b] The currently accepted normals are based upon arithmetical averages, tabulated in 1933 on the totals of reports from all sources, countries, or methods [3] and upon studies of ambulatory medical students and/or nurses [4] upon whom no history or physical examination is reported. Many textbooks, including the most recent copies available to us, have copied these figures as normal and have quoted these references as authority.

More recent studies are similarly lacking in adequate criteria for determining the "normal" person. For example, one chose all inmates in a home for aged patients.[5] Another studied groups of 4-H girls in summer camps whose local physicians considered them to be "health champions."[6] One paper included the study of college women "reported as healthy."[7] Another author chose to consider 48

Read at the 10th Clinical Meeting of the American Medical Association, Nov. 27, 1956, Seattle.

undergraduate students having an average age of 20, who were students in a college physiology course.[8] The authors of one report, in 1954, on hemoglobin determinations in 326 normal adult women frankly discuss their choice of women by stating, "There is a wide variety of adult subjects. There were some invalids among them, but any with disorders likely to affect the hemoglobin were excluded. Some were residents of an old folks' home. . . . In general, the adults were more healthy and in better socioeconomic class than those usually studied in surveys of this kind." [9]

Method of Procedure

There has been no study reported in which an effort was made to statistically compute the standard red blood cell count and hemoglobin level on women medically determined to fall within acceptable criteria for good health by careful clinical evaluations. We have proceeded to do this by reviewing 7,300 consecutive charts in our private practice. These charts represented women, at least 95% of whom were from middle-class homes. To the best of our knowledge they all have adequate standards of living. That is, all can afford adequate places to live, food to eat, and clothes to wear. All of them are private patients whose blood cell counts were taken in our office at various times of the day. We did not consider that altitude was constant in this study. The altitude in Spokane varies from 1,879 ft. to 2,383 ft. At least 30% of the women upon whom these counts were taken lived more than 50 miles away; many came from sea level; others crossed the mountains; many came by air. Some nearby towns have altitudes of less than 400 ft. To the best of our knowledge none of these women were using medicaments at the time the blood cell count was taken. None had been blood donors.

Oxalated venous blood was used in a Thoma pipet, and the erythrocyte count was made in a Spencer improved Neubauer counting chamber.[10] Hemoglobin determinations from oxalated blood were all done using an alkaline hematin method in a Leitz-Rouey photometer which had been standardized against the photometer at a local hospital. The techniques were not changed during the entire series.

We chose criteria for eliminating abnormalities as follows: No charts were included which presented any of the following medical histories: (1) upper respiratory infections within the previous three months, including the common cold, virus, or virus-like infections; pregnancy terminating within the previous three months; or major or minor surgery within the previous three months; (2) tuberculosis, cancer, hypertensive-cardiovascular disease, rheumatic heart disease, or venereal disease; (3) allergies, either mild or severe, diagnosed by well-authenticated history or physical examination; and (4) menstrual periods with an interval oftener than 25 to 28 days with flow heavier than enough to saturate three pads per day or lasting longer than seven days in the adolescent or five days in the mature woman.

Only those women were considered who had had a completely normal physical examination at the time of the red blood cell count and hemoglobin level determinations. All charts that showed any o the following were eliminated: (1) blood pressure higher than 140/100 mm. Hg; (2) pulse rate over 112; (3) gross pathology that could be discerned by fluoroscopic examination; and (4) abnormal physical findings other than *(a)* retroversion, cystocele rectocele, and prolapse, *(b)* leukorrhea (omitting positive gonorrhea), *(c)* simple inguinal femoral umbilical, or incisional hernia, *(d)* acne, *(e)* mild overweight or underweight, and *(f)* varicosities of the extremities. These latter changes we considered to have no direct or indirect influence upon either the red blood cell count or the hemoglobin value.

Last, all charts were eliminated that indicated that the following routine laboratory data deviated from normal ranges: (1) sedimentation rate higher than 20 mm. per hour (Wintrobe); (2) white blood cell count lower than 4,000 or higher than 12,000 per cubic millimeter; (3) abnormal differential blood smears; (4) presence of albumin, pus, casts, red blood cells, or sugar in the urine; (5) positive serology; and (6) positive smears for gonorrhea.

Most charts indicated additional laboratory or x-ray procedures. If these deviated from the normal, they were also discarded. The following abnormalities were always excluded: (1) basal metabolic rates lower than —15% or higher than +15%; (2) flat or high five-hour sugar tolerance curves; (3) nonprotein nitrogen level higher than 35 mg. per 100 cc.; (4) positive Robinson-Kepler-power water-test[10A]; (5) inadequate response to four-hour Thorn test with ATCH; and (6) x-rays showing pathology in the gastrointestinal tract, gallbladder, genitourinary tract, or chest.

This method of selection was used because all clinicians would probably agree that no "normal" woman presents a history of the diseases listed, the pathology discovered, or abnormal laboratory data reported. It seems unlikely that clinical investigators could set up a more definitive set of standards for the "normal." Moreover, it is felt that within the range of allowable statistical error of plus or minus two times the standard deviation, any investigator reviewing the same charts would select the same patients. Thus, from 7,300 consecutive charts, all but 663 were eliminated. For the purposes of this paper these 663 are considered to represent "normal" women.

Results

The mean or average red blood cell count for the 663 "normal" women was 4,370,000 with a standard deviation of plus or minus 282,000. The mean hemoglobin level was 12.55 Gm. with a standard deviation of plus or minus 1.15 Gm. Plus or minus two standard deviations from the mean would give a red blood cell count range of 3,810,000 to 5,030,000 within which 95% of normal women would fall by normal statistical methods.[11] Our range of hemoglobin determinations for "normal" women is 10.2 to 14.8 Gm. Our figures were considerably lower than the figures given by Osgood [4a] and Wintrobe,[3a] whose studies have been widely adopted as representing the normal red blood cell count and hemoglobin values for the normal adult female (table 1).

Our results are based on a much larger sampling than either Osgood's or Wintrobe's results, and our cases cover a much more representative age distribution and a more heterogeneous group of middle-class women. Osgood's study was on medical students and nurses who ranged in age from 14 to 30. Our subjects were from ages 11 to 68 and represent a wide variety of occupations—students and homemakers and industrial, business, and professional women. They are, in fact, the average women in a doctor's private practice. Wintrobe's figures are based on a compilation of data from all over the world obtained by many different investigators using various techniques; one is at a loss to know just how reliable each of the figures is.

TABLE 1.—*Comparison of Results in Present Study with Those in the Literature*

Study	Subjects, No	Red Blood Cell Count, Millions/Cu. Mm		Hemoglobin Level, Gm /100 Cc	
		Mean	Range	Mean	Range
Present study	663	4.37	3.81-5.03	12.55	10.2-14.8
Wintrobe[3a]	369	4.80	4.20-5.40	14.00	12.0-16.0
Osgood[4a]	152	4.80	4.20-5.34	13.80	11.5-16.0

While the studies of Osgood [4a] and Wintrobe [3a] appear to be representative of most of the work appearing in the literature,[10] there are some investigators who have obtained differing results; Gradwohl's text persists (1956) [2a] in stating that the normal red blood cell count is 4,500,000. Discombe [12] stated that, although he felt that the optimum hemoglobin value for women was similar to the 14.8 Gm. he found in men, the usual value he found in women was 12.6-11.8 Gm. Hervey and others [13] found that 12.6% of women were not able to meet the minimum standard of 12.3 Gm. of hemoglobin set by the American Red Cross for blood donors.

Myers and Eddy,[9] while giving a mean of 13.8 Gm. of hemoglobin for a large group of nurses, also stated that the average hemoglobin level for a group of 48 women aged 20 was 13.0 Gm. Pett and Ogilvie [14] found an average hemoglobin level of 12.7 Gm. in a group of 1,686 women. It is evident, therefore, that other investigators have also found women to have red blood cell counts and hemoglobin values lower than the currently accepted normal standards.

It has been assumed that the normal red blood cell counts and hemoglobin values do not vary with increasing age.[1a] We have tested this hypothesis by dividing our subjects into age groups. The results can be seen in table 2. There is a very little difference in the mean red blood cell count and hemoglobin level among the various age groups. Statistical analysis with use of the "t" test [11] did not indicate any significant differences. Thus it would seem that increasing age did not affect the red blood cell count or hemoglobin value. Hobson [15] likewise found that the hemoglobin value in older women was not significantly lower than the normal generally accepted for women.

TABLE 2.—*Red Blood Cell Count and Hemoglobin Level Findings According to Age Distribution*

Age, Yr.	Subjects, No.	Red Blood Cell Count, Millions/Cu. Mm.		Hemoglobin Level, Gm./100 Cc	
		Mean	Standard Deviation	Mean	Standard Deviation
11-19	121	4.37	0.420	12.61	0.91
20-29	255	4.39	0.265	12.61	1.15
30-39	142	4.35	0.393	12.47	1.03
40-49	89	4.32	0.396	12.48	1.14
50-69	56	4.35	0.334	12.55	1.07
Total	663	4.37	0.282	12.55	1.15

Several studies on adolescents have not shown consistent findings. Table 3 shows a comparison of our 11 to 19 year age group of women with similar groups in some of these studies. The 121 young women in this series were primarily students who came for school checkups, minor menstrual irregularities, or premarital examinations. Mugrage and Andresen [16] found an average red blood cell count of 4,660,000 and a hemoglobin level of 14.65 Gm. for a group of 95 adolescents 12 to 21 years of age seen in an outpatient department in Denver. Pett and Ogilvie [14] found an average hemoglobin level of 12.96 Gm. for 226 young women aged 13 to 19. Leichsenring and others,[6] studying 130 "health champions" ages 12 to 19 in a Minnesota summer 4-H camp, found a mean red blood cell count of 4,280,000 and a hemoglobin level of 13.0 Gm. In a group of randomly selected Minnesota high school girls [17] they found a mean red blood cell count of 4,150,000 and a hemoglobin level of 12.21 Gm. Our figures are similar to those of Leichsenring and others.[18]

TABLE 3.—*Comparison of Studies of Red Blood Cell Counts and Hemoglobin Level Findings in Adolescent Girls*

Study	Subjects, No.	Mean Red Blood Cell Count, Millions/Cu. Mm.	Mean Hemoglobin Level, Gm./100 Cc.
Present study	121	4.37	12.61
Mugrage and Andresen[16]	95	4.80	14.46
Leichsenring[17]	258	4.15	12.21
Leichsenring and others[6]	130	4.28	13.00
Pett and Ogilvie[14]	226	...	12.96

The type of symptoms, complaints, or diagnoses which brought these objectively selected 663 "normal" women to the doctor fell into three classifications (table 4). One group of 84 came without complaints, symptoms, or positive physical and laboratory findings. These included women who had come for premarital examinations or college or school examinations, adolescent girls who came at the request of parents, or women who considered themselves healthy and wanted to remain so. The second group was made up of normal women with physiological variants who, although normal by history and physical and laboratory examination, had complaints arising from anxiety, tension, or fatigue. The third group consisted of those presenting gynecologic complaints, i. e., dysmenorrhea, irregular menses (with an interval longer than 28 to 30 days), menopausal symptoms, leukorrhea (other than gonorrhea), cystocele, rectocele, retroversion, cervical erosion, premenstrual tension, and sterility. Actually, in this latter group there was considerable overlapping with the group showing only anxiety, tension, or fatigue. These three groups did show a difference in the mean red blood cell count and hemoglobin values, although all were "normal" when objectively appraised.

The group of "normal" women without complaints had a significantly higher mean red blood cell count and hemoglobin level than did the group with physiological variants as determined by statistical analysis using the "t" test.[14] The values in this group were also significantly higher than in the group with physiological variants and the group with gynecologic variants considered together. However, the values in the normal group alone were not significantly higher than in the gynecologic variant group alone. The values in the group with physiological variants were significantly lower than in each of the other two groups and also lower than in the other two groups considered together. It appears that, although women who present only complaints originating from anxiety, tension, or fatigue are normal to the usual physical and laboratory examinations, as a group they tend to have lower red blood cell counts and hemoglobin values than those who have other types of complaints or no complaints at all.

TABLE 4.—*Symptoms, Complaints, and Diagnoses in Six Hundred Sixty-Three Women*

Type	Subjects, No.	Mean Red Blood Cell Count, Millions/Cu. Mm.	Mean Hemoglobin Level, Gm./100 Cc.
"Normal"	84	4.44	12.79
Normal with physiological variants	293	4.33	12.46
Normal with gynecologic variants	286	4.38	12.55

Summary and Conclusions

We believe this to be the first time that a physician with well-trained laboratory personnel has analyzed consecutive case reports to obtain an adequate sampling so that a statistical determination of red blood cell counts and hemoglobin levels in normal women could be made. A sampling of 663 charts from 7,300 consecutive case records showed the mean or average red blood cell count to be 4,370,000 per cubic millimeter, with a range between 3,810,000 and 5,030,000. The mean hemoglobin level was 12.55 Gm. per 100 cc. with a range of 10.2 to 14.8 Gm. These are both significantly lower than the standards quoted as normal by hematologists and textbooks. Using the "t" test, there was no significant difference in the red blood cell count and hemoglobin value according to age grouping. These findings should be of value in both research and clinical medicine.

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The statistical analysis for this study was done by Mr. A. D. Kozanowski.

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INTERNAL AUDIT IN THE DEPARTMENT OF MEDICINE OF A COMMUNITY HOSPITAL

TWO YEARS' EXPERIENCE

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The purpose of this report is to relate the practical experience gained in evaluating the quality of the medical records in a community hospital. This project was undertaken as part of a program to test various methods of raising the level of patient care in this type of hospital. It is one facet of a rather unusual long-distance affiliation which was established between Georgetown University School of Medicine and St. Mary's Hospital in 1952. A preliminary report concerning the fundamental approach and some of the early results of the program[1] and reports on the development of an adequate library[2] and the integration of the general practitioner into the program[3] have documented some of the ideas which have been explored.

Briefly, the general plan includes the employment by the hospital of a full-time director of medical education to supervise the program. The university sends teachers to the hospital for three-day visits every other week. These teachers hold conferences for the staff, make bedside rounds, and consult on the hospital facilities and services. The program is under the over-all supervision of the professor of medicine at Georgetown University, who makes periodic visits to the hospital in a consulting capacity. The educational program, has for the most part, been conducted by internists, and the emphasis has been placed on internal medicine. Practically all innovations have been tried out in the department of medicine and later, if successful, are incorporated in the other departments. The method of evaluating medical records which will be described in this report was started at the beginning of 1956 in the department of medicine. At the beginning of 1957, the departments of surgery, pediatrics, and obstetrics and gynecology instituted the procedure with appropriate modifications.

Lembcke[4] has defined the medical audit as the "evaluation of medical care in retrospect through analysis of clinical records." He further distinguished between the internal audit, "which should be carried on continuously by the hospital staff" in "evaluating the quality of medical care in individual cases," and the "outside audit, in which case an outside agency periodically tests the completeness and accuracy of the internal audit." In this sense, the methods to be discussed in this presentation constitute an internal audit conducted in the department of medicine.

The medical audit here described was part of a program intended to evaluate and improve the quality of patient care in a hospital; the immediate question was the quality of the medical records. An auditing committee was formed to assign a numerical grade to each chart. The criteria were the accuracy and completeness of the diagnosis, the adequacy of the treatment, the adequacy of the progress notes, the use of consultation when needed, and the completeness of the physical examination. If a chart was given a mark below a critical level, the physician was notified and given the opportunity to review the chart with the auditing committee. The three members of the committee each had a tenure of three months. The fact that one member began and one ended service each month made it a group project; participation was a valuable experience and not an excessive burden. The medical audit has been effective in improving the medical records of the hospital. Staff members who have been doing good work can see that it is appreciated, and others are stimulated to improve.

Development of the Medical Audit

Historically, Ponton[5] is usually credited with the introduction of the medical audit. He proposed a standard form which listed various statistics which the record librarian was capable of assembling for the most part. He intended that these statistics should form a basis for comparison of work performed by different departments from month to month. The work of the librarian was to be supplemented by a medical man in three instances, i. e., cases of infection, cases in which secondary conditions developed, and deaths. Various indexes have been proposed since that time to evaluate the quality of medical care.[6] Lembcke has concluded, however, as did Myers and others[7] and Eisele,[8] that "most of the indexes of quality used in the past are now out of date or otherwise erroneous because of lack of research in the field."[4] These indexes have been applied in one of two general ways: (1) the method of gleaning statistics from the chart by a nonprofessional person, and (2) the review of the

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medical record by a physician or group of physicians. The first procedure has been subjected to extensive research recently by Myers, Slee, and Hoffman,[7] who have introduced the use of electronic devices to tabulate the statistics. The second device has been used by a number of hospitals[9]; according to Eisele[8] its "most serious handicap is that the usual medical audit consists largely of a collection of opinions of one individual, subject to all the inherent shortcomings of one individual." Lembcke attempted to overcome this objection by developing objective criteria by which a group of physicians might judge a limited area of medicine, i. e., female pelvic surgery.[4]

Method of Present Study

A number of factors were considered in deciding the general type of medical audit which would be most appropriate for our situation. Among these were the magnitude of the audit and the result which we wished to accomplish. The department of medicine consists of 105 beds in a 335-bed general hospital; about 2,700 patients are admitted to this department in one year. The patients are, for the most part, from the private practice of about 20 internists and 50 general practitioners. In establishing the medical audit, as in working out other projects of the hospital educational program, the primary object was to raise standards through the education of the staff. Thus, the statistical methods which employ nonprofessional personnel were not thought to be the most appropriate. It was felt that statistics gathered in this manner point out general areas of deficiency in hospital performance or individual physician performance but do not seem to be refined enough to delineate deficiency in patient care in a manner that is sufficiently specific for our purposes. For example, with the statistical method one can determine the percentage of pneumonia cases in which a particular physician obtains an x-ray of the chest; this can then be checked against an acceptable standard. This is useful information and might serve to indicate which physicians need further education concerning the use of the chest x-ray in cases of pneumonia. A system was preferred, however, which would indicate the specific instances (physician, patient, and circumstance) in which an x-ray should have been requested. This information seemed more useful from an educational viewpoint.

The review of the chart by physicians offered an opportunity for the staff to actively participate in the audit. In other educational projects which have been carried out successfully in this hospital, this dynamic aspect was an important factor in their success. It was decided that at least in the beginning it would be well to review the records of all patients discharged from the medical service rather than to take any short cuts, such as spot-checking. This decision to some extent influenced the indexes which were devised. To check all charts is a time-consuming task, and the check points were kept as simple as was thought to be compatible with a worthwhile evaluation.

We believed that the diffuse nature of the illnesses treated in the department of medicine precluded the development of objective criteria for each disease. In lieu of this, it was proposed to have a committee of experts in internal medicine review each record and in this way attempt to evaluate the handling of the case. There are, however, a large number of general practitioners who admit patients to this service, and it was felt that this point of view should be represented. This was not done to establish a double standard of quality for this group but rather because these physicians have a sufficiently different type of medical practice that it might influence their care of a patient. For example, their use of consultants would certainly differ from that of an internist. At the same time, to be certain that the reviewers would be experts, only general practitioners who were particularly adept at internal medicine were chosen for the committee. In order to avoid the objection that such an audit constitutes the opinion of one person, an attempt was made for it to be a group project, with provisions for continuity of the personnel on the committee. Accordingly, three men were chosen to serve on the audit committee. Each man had a tenure of three months; one member began and one ended service each month. One of the three physicians was a member of the department of general practice. In order to establish continuity of thought, the chairman of the committee was appointed for one year.

The members of the committee reviewed the records at their convenience, usually in the record room, and once a week they met to discuss certain records which the individual members had chosen. These selected records included all those below a certain arbitrarily chosen critical level, all those which were criticized for lack of consultation, and all those wherein the reviewer thought that a discussion was indicated to clarify a point which had puzzled him. These points were discussed by the group so that a uniform policy of marking was adopted. The following general questions were posed to frame the thinking of the committee in arriving at a numerical grade for each chart: 1. Was the diagnosis accurate, complete, and substantiated?—25 points. 2. Was the treatment adequate?—25. 3. Were the progress notes adequate?—25. 4. Was consultation obtained if indicated?—15. 5. Were the pelvic and rectal areas and eyegrounds examined?—10.

Factors of Evaluation

Diagnosis.—The Standard Nomenclature of Diseases and Operations is used in this hospital and has been for several years. The staff has been educated to a certain extent to the concept of making diagnoses which include the anatomic and etiological aspects of the disease, rather than symptoms alone. In answering question one, however, it was apparent that years of practice had established the custom of diagnosing only one pathological condition. The audit committee soon formed the opinion that the diagnosis of one clinical entity seldom covered the important aspects of a medical patient's illness. Thus, in a patient with a myocardial infarction the additional diagnoses of hypertension, shock, or congestive failure were frequently needed to adequately describe the patient's illness. On the other hand, one could easily make a dozen or more diagnoses in many instances, and yet the committee did not feel justified in penalizing a physician for failure to mention an inconsequential finding. Nor could one always confine the diagnoses to those clinical situations which were current, e. g., pneumonia in a patient who previously had a myocardial infarction is more significant than an uncomplicated case of pneumonia. In summary, the committee decided that the diagnosis was adequate if all the clinical entities which were pertinent to the illness which necessitated hospital admission were documented in the record.

The second factor taken into consideration under the first question was the confirmation of the clinical diagnosis by what the medical audit committee considered to be the usually accepted means. This might take the form of properly documented statements in the medical record of observations made on physical examination, consultation, and laboratory or x-ray procedures as might be indicated by the particular case. Thus, a diagnosis of pneumonia might require an x-ray of the chest; a suspected myocardial infarction indicates the necessity of having one or more electrocardiograms taken. It was apparent that compliance with suggestions relevant to this point aided the physician in clearly reasoning out the situation. The following case illustrates this point:

A 35-year-old man was admitted to the hospital with jaundice of two weeks' duration. There was no history of ingestion of chlorpromazine (Thorazine) hydrochloride or exposure to chemicals. His health had been normal prior to the onset of the jaundice, which was accompanied by anorexia and general malaise. At physical examination, the jaundice was noted and the liver edge was felt about 2 fingerbreadths below the costal margin. Otherwise, the findings were within normal limits. Laboratory findings were within normal limits except for a serum bilirubin level of 10 mg.%. The alkaline phosphatase level was 20 Bodansky units per 100 cc., and the thymol turbidity was 4 units. After one week in the hospital, during which time the disease appeared to be stationary, the patient was discharged with a diagnosis of infectious hepatitis.

The committee marked this as below the critical level because it was felt that obstructive jaundice had not been ruled out. Within a month, the action of the committee was justified by the finding of carcinoma of the head of the pancreas on surgical exploration of the abdomen.

Treatment.—Question 2 concerns the adequacy of treatment. The implications here are rather obvious. In actual practice, one comes on many controversial conditions in evaluating this point. This committee took a rather liberal viewpoint in accepting a physician's opinion of proper treatment. Thus, it would not take issue with the physician who used anticoagulants in treatment of the so-called good-risk patient with myocardial infarction but would subtract credits for the use of penicillin in an infection due to Escherichia coli. The committee took the viewpoint, however, that when the treatment was not the only one that was indicated the physician's reason should be clearly stated in the progress notes. In general, however, deductions were seldom made on this point. It was felt that 25% of the total gave too much weight to treatment.

Progress Notes.—Question 3, "Were the progress notes adequate?" was so phrased in order to evaluate the physician's direct responsibility to write notes on his patient's chart. Ordinarily, the interns and residents write the history, physical examination, and progress notes. The attending physician is responsible for the entire chart and thus for those parts of the record which the interns and residents write. Because of this, the physician must indicate any corrections that are needed in these notes. In addition, under ideal conditions, it was felt that the attending physician should write an admission note, an appraisal note, and a discharge summary. In the admission note, the attending physician should add to the intern's history the information that he has gleaned through previous contact with the patient. He thus adds certain information which is usually not available in the history. The appraisal note is a brief synthesis of all relevant information on the patient's illness, including laboratory procedures, therapy, diagnosis, and significance of the illness to the general life situation of the patient. This note should be written after the patient has been in the hospital for three to seven days. The summary note gives the attending physician an opportunity to draw all the loose ends of the case together and take advantage of his previous clinical experience to synthesize a diagnosis. During the first two years after the audit was inaugurated, the hospital had a smaller number of interns than usual. In order to keep the intern's case-load at the optimal number, about half of the patients were not assigned to the house staff. The visiting staff was responsible for writing up the entire chart on the unassigned patients and, in order to prevent undue hardship on this group, it was decided that of the three notes listed above only the admission note would be required. In addition, the attending physician was expected to add notes which were needed to supplement or amend the progress notes of the house staff.

It was soon apparent that admission notes were a rarity at this hospital. Progress notes were fairly frequent but were, for the most part, uninformative. These notes often stated that the patient was "doing fine" or "continuing to improve," or they consisted of a repetition of some laboratory or x-ray finding which was formally reported in another part of the chart. Many cases which were actually well managed appeared to be poorly handled because the physician's reasoning processes were not recorded in the chart. It was pointed out to the staff that these notes were considered to be adequate when a person unfamiliar with the patient (i. e., a committee member) could get a fair grasp of the case, including its course and management, by reading the chart.

Consultation.—Question 4, concerning the necessity of consultation, was perhaps the most difficult one to answer. Most hospitals attempt to formulate some regulations concerning situations which require consultation. The rigidity of these regulations probably bears a roughly inverse relationship to the quality of the hospital's staff. The better physicians need no written rules to force them to ask a consultant to see their patients; rules imply mediocrity and lead to a uniformity of action, which is not necessarily good. The following regulations for consultation on medical patients at this hospital were devised: "Consultation shall be obtained with any recognized internist for all patients whose cases are undiagnosed after five days in the hospital or for those patients with diagnosed cases who are not making suitable progress within one week, except those with some terminal conditions. Consultation shall also be obtained in all of the following cases: coma, meningitis, and arterial occlusion, including coronary occlusion with myocardial infarction when the latter is complicated by shock, failure, or arrythmia."

The difficulties which had been experienced at St. Mary's Hospital in attempting to formulate rules for consultation are well expressed in the following memorandum prepared by the Commission on Accreditation of Hospitals: "In the case of other consultations, those in which serious illness, poor surgical risk, or obscure diagnosis is involved, it seems almost impossible to specify the conditions under which such consultation shall be required. In general, it is the conscience of the attending physician which will determine whether or not a consultation is needed."[10] Furthermore, it is within the domain of the hospital to decide if such a consultant is qualified. This prerogative is delegated by the hospital to the audit committee. When points were deducted for consultation it was customary for the entire committee to discuss the matter.

Pelvic, Rectal, and Eyeground Examination.—Question 5, concerning pelvic, rectal, and eyeground examination, is rather obvious. These three items stood out as indexes by which one could spot-check for completeness of the physical examination.

Grading.—After an initial experience gained by a so-called "dry run," the mark of 75% was adopted as a passing grade. It appeared that the majority of records were above this mark, and the ones which fell below stood out as being seriously deficient. A letter was written to the physician if he was assigned a mark below 75%. This letter indicated the score attained and the items for which points were deducted. The physician was offered the opportunity of reviewing the chart with the audit committee, and a number of interviews have been conducted.

Results

On evaluation of the experience gained with this mechanism after two years, several points seemed clear. In general, it was apparent that a group of experts could objectively judge the work of an individual by using the criteria outlined. In the great majority of instances, this group of auditors was satisfied that the mark which they assigned to the chart by rigidly adhering to these objective criteria was, in their best judgment, a fair mark. In a few instances, it was apparent that by following these criteria an unjustly low mark would be assigned to the chart; somewhat less frequently a poor chart would receive a passing grade. To the extent that this exists, the audit is imperfect. Thorough discussion of these discrepancies by the committee at weekly meetings helped to clarify and unify the interpretation of the criteria. Where it was indicated, the interpretations were modified. In spite of this, however, there was always room for the exercise of good judgment on the part of the auditor. The criteria of an audit, like all man-made laws, are only the tools of justice.

In order to insure the fact that the marks would be comparable, the audit committee did not make major changes in the criteria during the first two years. Only one major change will be instituted at the end of two years. As indicated previously, it was found that 25% of the total credits given to treatment is too high. It was seldom that points were deducted for this item, and, because it was weighted too heavily, a certain number of poor charts received falsely high marks. By reducing the points allowable for treatment, the audit becomes essentially a critique of the diagnostic examination together with its proper recording on the chart.

At the end of each year, the average of each physician's marks was sent to him along with an indication of the distribution of marks in the entire group. With this information he could compare his average with that of the other members of the staff. He was also given a breakdown of his marks so that he was made aware of the number of poor grades as well as the failing grades. Each physician was also given the privilege of reviewing his marks in detail at any time he so desired. In certain instances, the committee notified individuals of certain important findings which the doctor had apparently overlooked. This was done whenever the welfare of the patient was directly implicated, e. g., the report of a positive Wasserman test which was returned by the laboratory after the discharge of the patient from the hospital and so escaped the attention of the doctor.

On review of its work at the end of two years, however, the committee was not completely satisfied that these methods of informing the physician exploited the educational potential of the audit to the fullest degree. Although the physician was notified about his poor charts at the time of the patient's discharge from the hospital, he did not learn about borderline charts until the end of the year. More properly, he should be made aware of current trends in his work. In this way, the doctor would be more apt to seek the counsel of the auditors when the case was fresh in everyone's mind. Accordingly, it was recommended that letters be sent to the staff members not only for failing grades but whenever they had a poor chart. In addition, the recommendation was made that a summary of each physician's performance be sent to him quarterly rather than annually.

The active staff at this hospital consists of the junior, assistant attending, and attending staff. Promotions are made on the basis of merit as judged by a person's qualifications and degree of participation in the educational program. The physician's performance in the medical audit has become another objective criterion of merit. It is used to evaluate a staff physician's work along with his attendance at weekly departmental meetings, attendance and quality of performance on ward rounds, and the opinion of the department head. The medical audit has perhaps been even more useful, however, as a method of detecting inferior quality of work. In appraising the low marks attained in the audit, consideration was given both to the number of low individual marks and to the average mark. It was observed that a person might attain a passing average in spite of a number of low marks if the volume of his practice was large. This sort of situation might be just as undesirable as that of the person with a small volume of patients on all of whom marks were moderately low.

These yardsticks were used as a basis of instituting certain measures to improve the quality of the staff. Accordingly, at the end of the first year four physicians were placed on probation. A penalty of restricted admitting privileges was imposed by the board of the hospital on those physicians who were on probation in order to indicate to them the gravity of the situation. They were allowed to admit patients to the medical service only when at least 5% of the beds were empty. The work of two other physicians was found to be inadequate, and they were required to have consultation on all cases which they admitted. This exception was made because these physicians are elderly. One physician's work was borderline, and a letter was sent to him stating this fact. At the end of the second year there were indications of sufficient improvement in the work of two of the physicians on probation to warrant reinstatement of full hospital privileges. The work of one physician continued to be poor, but on investigation it was found that he had certain personal problems which might be amenable to psychotherapy. He was accordingly counseled, but for the protection of the hospital and his patients he was required to obtain consultation on all patients he admitted to the hospital. The fourth physician's work failed to improve, and he was dropped from the staff at the end of the second year. Three additional physicians were put on probation; one of these had been found to have a borderline record at the end of the first year, as was indicated previously. Five more staff members were sent letters indicating that their work was borderline.

Comment

The audit has been time consuming for the members of the committee. In spite of the fact that the indexes are general and the audit has been purposely kept simple, the review of each medical record represents a considerable effort. On an average, each member reviewed 192 charts in his three-month association with the audit committee. This could probably be decreased by spot-checking or considering only the records of patients who died. The extent to which this is carried out might depend to some extent on the need for an audit, i. e., the quality of the staff. St. Mary's Hospital is probably an average community hospital; the educational program is relatively young, and the committee felt that at least in the beginning the audit should be quite thorough and include every record. It should be pointed out also that the latitude allowed within the rather general framework of the indexes outlined can be regulated by the committee. For example, the averages of the members of the department of medicine for the second year ranged between 90 and 100. In view of this, the failing grade of 75%, which was determined at the beginning of the audit, was very liberal. Thus, at the end of two years not only the change in criteria mentioned will be made but a general tightening up of the tolerance allowed in interpretation of these criteria is expected. In this way, we believe, the mechanism of this audit allows for a gradual and continuous education of the staff.

Conclusions

In general, it might be said that the medical audit has been an effective means of improving the medical records in this hospital. Indirectly, we believe that it has also improved the quality of patient care. There is a great deal to be accomplished in these matters as yet, and it will be a number of years before any plateau is reached; however, there is no doubt that significant gains are being made. The fact that the staff physicians know that their work is being observed has stimulated them to improve; by the same token, it has encouraged some men who have been doing good work for years to have someone appreciate this fact. Some few have not improved, and these have been handled on an individual basis.

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CLINICAL NOTES

SIMPLIFIED "CUT-DOWN" (VENOSTOMY) TECHNIQUE

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The purpose of this communication is to present a simplified method of performing a "cut-down" (venostomy). While the indications for the procedure are generally well recognized, the methods employed are often time consuming and cumbersome. Special instruments have been devised to facilitate its performance,[1] which, while undoubtedly helpful to the individuals skilled in their use, are not absolutely necessary and are not likely to be at hand in a real emergency.

The difference of this method from the accepted standard procedure[2] consists in making a longitudinal rather than a transverse incision and omitting the usual proximal ligature of the vein.

The details are shown in the accompanying diagrams. A transverse incision (fig. 1) results in an irregular wound distorted by the elasticity of the polyethylene tubing. The tubing itself is in danger of becoming kinked at the point of its entrance into the vein. The distortion of the vein at this spot makes a snug fit impossible, with a resultant leak of blood. A proximal ligature is necessary.

With a longitudinal incision (fig. 2), the tubing (or cannula) lies snugly and smoothly in the wound. There is no distortion of skin margins and no kinking of tubing. The part of the cannula or tubing outside the lumen of the vein compresses the vein proximally, so that, with the help of a small pressure dressing, complete hemostasis is achieved.

In an emergency, a knife, one pair of hemostats, a few squares of gauze, and a bandage are all that is required. A bottle of infusion solution and a set of plastic recipient tubing are, of course, essential, but if no polyethylene or metal infusion cannula is available, an ordinary large-bore needle with its sharp point snipped off with scissors will do. Skin antiseptics, sterile drapes, and local anesthetics are all desirable but can be dispensed with.

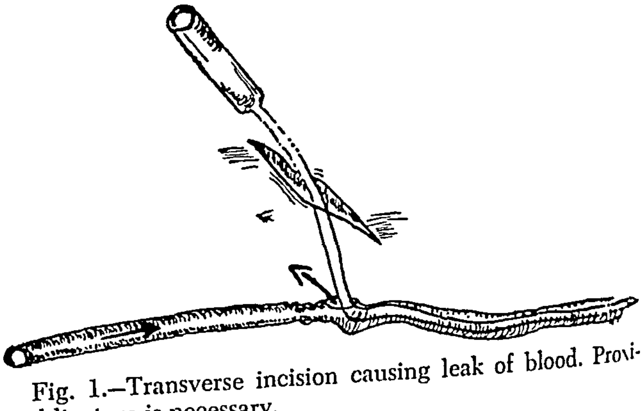

Fig. 1.—Transverse incision causing leak of blood. Proximal ligature is necessary.

Another advantage of this method is that there is much more room for the initial dissection within the margins of the longitudinal incision over the course of the vein. The danger of injuring the vein is minimized, and its complete accidental division is impossible. This results in a marked saving of time, especially in inexperienced hands. Further,

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if the vein is not tied there is no need to continue an intravenous infusion longer than necessary just to keep the vein open. In most cases, a new cannula can be slipped into the same vein hours or even days after the original venostomy has been discontinued. No ligature material is left in the wound. The risk of vein thrombosis and wound infection is minimized.

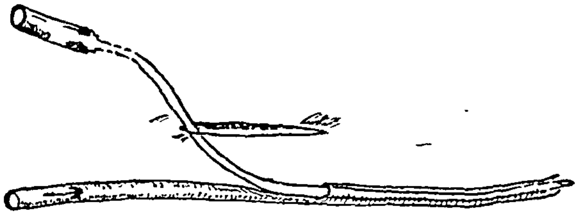

Fig. 2.—Longitudinal incision, with vein compressed by tubing and dressing. No ligature is needed.

Utilizing instruments and dressings available in any medical office, ambulance, or doctor's bag, it is possible to perform the procedure by the roadside, in the case of an automobile accident, or in the home of a patient, in the case of a severe hematemesis, vaginal bleeding, extensive burns, or any other accident or disease in which rapid fluid replacement is indicated. This may be of great importance during or after an enemy attack with nuclear weapons or in emergency conditions of tornadoes, hurricanes, earthquake, and other natural disasters. When communications are disrupted and hospitals are destroyed or deluged with casualties, dependence on customary facilities may prove disastrous.

Summary

A modification of the usual technique of performing a "cut-down" (venostomy) for purposes of parenteral administration of fluid consists of making a longitudinal rather than a transverse incision. Advantages of this method include saving of time and the necessity for a minimum of equipment.

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AGRANULOCYTOSIS RESULTING FROM METHIMAZOLE (TAPAZOLE)

REPORT OF THREE CASES

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Since the introduction of methimazole (1-methyl-2-mercaptoimidazole; Tapazole), in 1949, it has been utilized as a potent antithyroid drug. Stanley and Astwood[1] found methimazole to be approximately 100 times as active as thiouracil. In recent years it has almost completely replaced thiouracil and propylthiouracil in the medical treatment of hyperthyroidism. However, a number of toxic reactions have been observed with the use of this agent. The occurrence of agranulocytosis following the administration of this drug constitutes a real hazard to life. It is our purpose to direct further attention to this possible dangerous toxic effect of methimazole by reporting three instances of agranulocytosis induced by this drug, one terminating fatally.

Schultz[2] first described agranulocytic angina, an apparently new disease, in 1922. Since then many persons have died after the ingestion of medicaments prescribed for such diseases as hyperthyroidism, arthritis, cardiovascular diseases, allergic diatheses, epilepsy, and the psychoses. Kracke[3] first suggested a chemical or drug etiology rather than some infectious or other disease factor to explain this phenomenon. He concluded that the common factor producing the toxic reaction in many of these drugs was the presence of the benzene ring, particularly in combination with nitrogen or an amino or an imido group. Thiouracil has such a six-ring structure, but methimazole has a five-ring structure. Dameshek[4] theorizes that in many instances an abnormal immunological mechanism may be responsible.

Granulocytopenia, agranulocytosis, thrombocytopenia, and aplastic anemia have all been reported as hematological reactions to methimazole. Bartels and Sjogren[5] first reported the occurrence of granulocytopenia following the use of this substance in the therapy of hyperthyroidism. Croke and Berry[6] recorded the first episode of agranulocytosis. A fatal instance of agranulocytosis was observed by Specht and Boehme.[7] Toxic hepatitis in association with agranulocytosis was noted by Reveno and Rosenbaum.[8] Aplastic anemia was the hematological abnormality presented in the report by Levine and Rosenberg.[9]

In a group of 116 patients given methimazole in preparation for surgery, H'Doubler and H'Doubler[10] detected one case of agranulocytosis and two of granulocytopenia. Donor bone-marrow injection combined with cortisone was credited by Ainsile and Harley[11] in effecting recovery in a patient with agranulocytosis produced by methimazole. A number of episodes of granulocytopenia and thrombocytopenia reported by other authors[12] are evident in a survey of the literature.

Report of Cases

Case 1.—A 76-year-old female was referred for treatment of arteriosclerotic heart disease with associated severe congestive heart failure. The usual regimen of reduced physical activity, digitalization, low-salt diet, and mercurial diuretics was insufficient to control the severe manifestations of the heart failure. Consequently, administration of methimazole was begun in order to produce a hypometabolic state designed to lessen the load on the failing heart. Methimazole was given in a dosage of 30 mg. per day. In addition, mercaptomerin (Thiomerin) sodium was given at infrequent intervals, and procainamide (Pronestyl) hydrochloride was given to lessen myocardial irritability manifested by numerous premature ventricular contractions from several foci. With onset of symptoms of sore throat, fever, nausea, and vomiting a complete blood cell count was obtained, at which time the white blood cell count was 700 cells per cubic millimeter, with 100% lymphocytes present. The patient was hospitalized immediately.

Physical examination revealed an elderly, acutely ill female. Her temperature on admission was 104 F (40 C), the pulse 110 per minute with extrasystoles present, and the blood pressure 130/80 mm. Hg. There was diffuse redness and edema of the oropharynx, and rounded yellowish plaques were present on the remnants of the tonsils. The heart was grossly enlarged to the left, and a grade 2 systolic murmur was heard at the apical area. Small, moist rales were present in both lung bases. The liver was not felt, and no peripheral edema was noted.

The sternal marrow was extraordinary in several respects: 1. There was a complete absence of the granulocytic elements, and nothing resembling a myeloblast or more mature cells of the granulocytic series could be found. 2. There was a moderate increase in the amount of fat above the normal expected at this age, but megakaryocytes were present in normal numbers and showed good platelet formation. 3. A moderate increase in reticuloendothelial cells was found, and many of these cells appeared phagocytic, but no transition toward the myelocytic cells was detected. 4. Active normoblastic erythropoiesis was present. The marrow thus demonstrated a selective complete absence of granulopoiesis, with moderate increased reticulum cell activity but no damage to other constituents.

In spite of liberal administration of ACTH and the broad-spectrum antibiotics, there was no apparent change in the patient's condition. The white blood cell count ranged from a high of 850 cells to a low of 125 cells per cubic millimeter, all of which were lymphocytes. The patient died on the sixth hospital day, after developing evidence of bronchopneumonia.

Case 2.—A 73-year-old male had received treatment for arteriosclerotic heart disease with atrial fibrillation and congestive heart failure with a program of digitalis, diuretics, low-salt diet, and moderate restriction of physical activity, with excellent control of symptoms. Marked weakness, sweating, and weight loss in spite of a good appetite supervened, and the degree of heart failure increased. The clinical impression of hyperthyroidism was substantiated by a protein-bound iodine value of 10.1 mcg. (normal is 4-6 mcg.). Accordingly, methimazole was given in a dosage of 10 mg. three times daily in addition to more vigorous measures to control the heart failure. White blood cell counts were performed at weekly intervals for one month. All counts were within normal limits, a representative count showing 6,950 cells per cubic millimeter, with 56% segmented cells, 38% lymphocytes, 3% stab cells, 2% monocytes, and 1% eosinophils. During the sixth week of treatment with methimazole, the patient complained of a sore throat and slight fever. A white blood cell count at this time showed 1,050 cells per cubic millimeter, all lymphocytes. On blood smear no neutrophils could be found, but the platelets and red blood cells appeared normal. On physical examination the entire pharynx was diffusely reddened, but no vesicles were seen. The temperature was 100 F (37.8 C), the apical pulse 72, and the blood pressure 120/80 mm. Hg. The lungs were clear, and no peripheral edema was evident. ACTH and antibiotics were administered. The white blood cell count was 1,000 and 1,800 per cubic millimeter on the following consecutive days, with 100% lymphocytes present. On the fifth and sixth days of therapy the white blood cell count was 3,150 per cubic millimeter, with 6% and 27% neutrophils respectively. The symptoms of sore throat and mild fever had cleared completely at this time. On the seventh day of therapy with ACTH, a count of 6,700 white blood cells per cubic millimeter with 37% neutrophils was found, and therapy with ACTH was discontinued. Two weeks after onset of the agranulocytosis the white blood cell count had returned to the normal of 10,750 per cubic millimeter, with 54% neutrophils.

Case 3.—A 20-year-old female presented herself for treatment with the typical symptoms and signs of hyperthyroidism, including tachycardia (130 beats per minute), generalized tremor, enlarged thyroid gland, protein-bound iodine value of 23 mcg., and 24-hour radioactive iodine uptake of 94%. A decision to treat her medically with methimazole was made, inasmuch as she was adamant regarding surgery. Consequently, she was given 30 mg of methimazole daily, with progressive increase in dosage to 50 mg. daily because of lack of response to the drug. Periodic white blood cell counts were within normal limits. Twelve weeks after treatment was begun the patient developed a severe sore throat accompanied by a temperature of 104 F (40 C). When the patient was admitted to the hospital, the white blood cell count was 600 per cubic millimeter, with 100% lymphocytes. The remainder of the blood cell count was normal.

The patient appeared acutely ill, with her temperature 105 F (40.6 C), pulse 160 per minute, and blood pressure 126/82 mm. Hg. The posterior pharynx was fiery red, with patchy white exudates present. The skin showed a maculopapular eruption over upper and lower extremities. Intravenously given hydrocortisone along with penicillin and tetracycline were administered, and there was rapid defervescence to a normal level within 24 hours. Although the patient appeared clinically greatly improved, the severe sore throat and marked leukopenia persisted for a period of five days. The white blood cell count varied from 400 to 1,250 cells per cubic millimeter during this time. On the sixth day a white blood cell count of 2,590 per cubic millimeter was evident, with 30% myelocytes, 1% band cells, and 2% polymorphonuclear leukocytes present. After this, the white blood cell count gradually increased to 11,350 on the 12th day, with a normal differential count. Bone marrow studies revealed a striking lack of granulocytes. Many adult lymphocytes were present. Erythropoiesis appeared normal. Megakaryocytes were plentiful, and the examination of the peripheral blood revealed abundant platelets. It was concluded that a striking maturation arrest of granulocytes at the myelocytic stage was present. Radioactive iodine has been subsequently administered to this patient.

Comment

In the early use of methimazole, skin manifestations were observed as the primary sensitivity reactions, with an over-all incidence of 6 to 7.5%.[5] It is known that hematological reactions have a much lower order of incidence, although it is impossible to state with accuracy the exact degree. Inasmuch as sensitivity to methimazole is considered to occur entirely on an individual basis, it appears unpredictable. The size of the dose of drug administered apparently has no influence on the development of agranulocytosis.

In agranulocytosis, the prostration may be extreme, with high fever and chills, and symptoms of a generalized infection seem evident. The patient may appear moribund when these clinical features are added to those present from the underlying thyrotoxicosis. The bone-marrow study generally reveals partial or complete absence of granulopoiesis, or frequently there is evidence of maturation arrest of the granulocytes. This arrest may be present alone or with selective depression of other cellular elements.

There is general agreement that heroic therapy is necessary in this type of patient, primarily with the adrenal steroids and with sufficient antibiotics to prevent sepsis. With rapidly developing anemia transfusions are indicated, especially if there is a positive Coombs test. In the presence of marked thrombocytopenia, fresh blood transfusions in plastic bags may be of great value.

Most authors recommend that white blood cell counts be performed routinely at frequent intervals to aid in the early detection of leukopenia in order to forestall the occurrence of agranulocytosis. However, there is no unanimity of opinion that this is a valid assumption. On the contrary, Young[13] argues that frequent blood cell counts are neither necessary nor informative. His thesis is that the peripheral blood reflects changes taking place in the marrow only after the changes in the marrow are far advanced. Therefore, as previously indicated by Croke and Berry,[6] there are two considerations in this regard: (1) whether agranulocytosis occurs with sufficient frequency to warrant expenditure of the additional time and expense involved, and (2) whether frequent blood cell counts will anticipate the onset of agranulocytosis. Although an answer to these questions is not clear in the light of our present knowledge, it appears prudent for the present time to advocate frequent blood cell counts during administration of methimazole.

Summary

In three cases, agranulocytosis followed the administration of methimazole (Tapazole). Frequent performance of white blood cell counts is advisable during the administration of methimazole, although it is not certain that this measure will anticipate the possible production of agranulocytosis by this drug.

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DIAGNOSTIC PROBLEMS

FEVER, COUGH, AND PAIN IN RIGHT LOWER COSTAL REGION

Clinical Pathological Conference (PM 325-54), Dec. 5, 1957, from the Department of Pathology and the Hektoen Institute for Medical Research of Cook County Hospital, Chicago, presented for publication by Daniel S. Kushner, M.D., and Paul B. Szanto, M.D.

Clinical Data

A 35-year-old woman was admitted to Cook County Hospital on March 3, 1954. Eight weeks before admission, she developed slight nausea, anorexia, and fatigue. Five weeks before entry, she also complained of muscle aches and pains, fever, and drenching night sweats. One week later, she began to cough a half cupful per day of thick, yellow, "sweet tasting" sputum. At the same time she developed a constant, dull pain in the right lower anterior portion of her chest, which was aggravated by cough and deep respiration and radiated to the right upper abdominal quadrant. She had been bedridden for three weeks because of weakness, and had noted two or three watery stools daily, without blood or mucus. She had suffered a weight loss of 30 lb. (13.6 kg.) in two months; she had been addicted to heroin for six months; she used alcohol in moderation; and she had had some dizziness in the two weeks before admission.

Physical examination revealed an acutely ill, emaciated, but well-developed woman. Her blood pressure was 128/60 mm. Hg, pulse 108 per minute, temperature 101.8 F (38.7 C). Dulness to percussion, decreased tactile and vocal fremitus, and diminished breath sounds were noted over the lower half of the right side of her chest. There was tenderness and guarding of the right side of the abdomen, where liver dulness was percussed 2 fingerbreadths below the costal margin. Multiple needle marks were present on the forearm. The remainder of the physical examination was normal. Her hemoglobin level was 46%, erythrocyte count 2,390,000 per cubic millimeter, leukocyte count 6,500 per cubic millimeter, hematocrit 24%, and sedimentation rate 27. Her nonprotein nitrogen level was 22 mg. per 100 ml., total protein 6.7 Gm. per 100 ml., phosphorus 4.6 mg. per 100 ml., chloride 89 mEq. per liter, sodium 121 mEq. per liter, potassium 4 mEq. per liter, alkaline phosphatase 6.6 Bodansky units, and icterus index 8. The reaction to the Kahn test was unsatisfactory, but the Wassermann reaction was positive. Her sputum was negative for acid-fast bacilli on smear and culture. Stools were negative for ova and parasites.

She continued to complain of pain in the right lower portion of her chest, and she had a persistent tachycardia. A tuberculin skin test (1:100) was negative at 24 and 48 hours. The patient's course was rapidly downhill in spite of blood transfusions and administrations of fluids parenterally, vitamins, and penicillin, and she died nine days after admission, and nine weeks after the onset of her symptoms.

Clinical Discussion

Dr. Frederick Steigmann: This patient's nausea, anorexia, weakness, muscle aches and pains, fever, and sweats could have resulted from many conditions, and suggest systemic toxicity from infection. The prominent cough and expectoration point to pulmonary involvement, such as bronchiectasis, lung abscess, carcinoma of the lungs with abscess formation, or a complicated type of pneumonia. The thoracic pain, radiating to the right upper abdominal quadrant, could be explained by disease of the lower lobe of the right lung, with involvement of the diaphragm, but she did not have a long-standing cough and copious sputum as one would expect with bronchiectasis. She gave no history of antecedent pneumonia, or aspiration of foreign material, which could have led to acute lung abscess. She was rather young and had a very short history for a bronchogenic carcinoma. Among the inflammatory pulmonary diseases, one would have to consider tuberculosis with pleurisy. Whatever the cause, the fulminating course is more consistant with infectious than neoplastic disease. The absence of clubbing of the fingers could be explained either by the short duration of the process, although clubbing may appear rapidly in a patient with an acute lung abscess, or by the possibility that the pulmonary involvement was secondary to another disease.

Since she was a heroin addict, one must consider such infectious conditions complicating addiction as bacterial endocarditis, malaria, and homologous serum jaundice. None of the manifestations of en-

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docarditis or malaria were present. The onset of homologous serum jaundice in heroin addicts may show atypical features. More importantly, the patient may have become infected through self-administered intravenous injections, with resultant staphylococcic infection and generalized pyemic abscesses.

In view of the history of diarrhea, one must consider colitis and enteritis, with secondary involvement of the liver, which may produce hepatic tenderness and low-grade fever. Occasionally cholecystitis causes symptoms referable to the chest, but this could not explain the cough and expectoration.

All of the symptoms and physical findings suggest two or three conditions which could explain both the abdominal and pulmonary manifestations. In order of their frequency these would be (1) amebiasis; (2) pyogenic abscesses of the liver; and (3) fungus disease. In the United States, the incidence of intestinal amebiasis ranges from 5 to 30%. Most amebic carriers are asymptomatic. Patients with amebic liver abscess may give no history of diarrhea, and frequently no amebas are demonstrable in the stool. As a rule, the patient with active amebic liver abscess has a gradual onset of progressive nausea, anorexia, and fatigue. If the abscess involves the diaphragm, pleura, and lung, the patient may develop pain in the right lower portion of the chest, aggravated by cough, and a profuse expectoration of sputum. The incidence of liver abscess in clinical nonfatal cases of amebiasis ranges from 1.8 to 5% in various communities.[1] If the fatal cases are included, the incidence of liver abscess varies between 5 and 38%.[2] Hematogenous spread of Entamoeba histolytica to the lungs occurs rarely. The majority have a huge abscess in the liver which extends directly through the diaphragm to the pleura, and then to the lung, producing a contiguous abscess in the lower lobe. It may extend directly into the lung to involve a bronchus, causing profuse expectoration of purulent material, or an empyema may form first, which later penetrates a bronchus and produces expectoration. This would explain this patient's chest pain and expectoration. The yellow sputum described by the patient is atypical for amebic abscess of the lung. Characteristically, the sputum of amebic lung abscess is variously described as resembling chocolate, anchovy paste, or apple butter in color and consistency. The sputum frequently contains liver tissue and blood, and therefore has a brown color, but yellow sputum may occur in amebic lung abscess, in the presence of associated secondary bacterial infection.

The severe weight loss, drenching night sweats, and muscle aches and pains resembling arthritis can occur with amebic liver abscess. The sputum contains amebic cysts or trophozoites in 70% of patients with amebic liver abscess, if it is repeatedly examined. In the absence of such confirmatory evidence, amebic lung abscess may masquerade as tuberculosis, pneumonia, bronchiectasis, or pyogenic lung abscess. Most importantly, these patients die if they are not treated specifically with emetine. Emetine therapy is so effective that it can be used as a diagnostic test. Within 48 to 72 hours after initiation of specific treatment, these very ill patients begin to improve.

With regard to other diagnostic possibilities, pyemic (hematogenous) abscess of the liver is half as frequent as amebic abscess. It is secondary to a systemic infection, and usually has a more dramatic onset; the patient is more acutely ill, and has a temperature as high as 106 F (41 C), but the remaining symptoms and signs may be similar. Fungus infection would seem unlikely, in the absence of any history of residence in an endemic locality, and with no dermatological or other systemic involvement. The possibility of a necrotic primary carcinoma of the liver, which extended upward into the lung, must be considered. This patient was an alcoholic and her liver may have been cirrhotic, as a background for development of hepatocellular carcinoma. However, the alcoholism and narcotic addiction would also have contributed to malnutrition and, therefore, to the development of amebic liver abscess. The normal liver is not as susceptible to amebic infection as is the liver which has already been damaged by infection, alcoholism, or malnutrition. I, therefore, would conclude with the probability of amebic liver abscess, secondarily involving the lower lobe of the right lung.

Dr. Irving Greenberg: A roentgenogram of the abdomen shows distended loops of small and large intestine, with opaque areas suggesting fluid between the loops. The properitoneal fat line is obscured, also indicative of intraperitoneal fluid. The liver is enlarged. There is a small oval density over the margin of the ileum.

Dr. Steigmann: If this were peritoneal exudate, one would have to consider the possibility of a subdiaphragmatic abscess, due to perforation of the appendix or a peptic ulcer. A pylephlebitic abscess of the liver, secondary to intraabdominal suppuration, could rarely also cause hepatic and subdiaphragmatic abscess and perforate through the diaphragm to produce pleural involvement.

Dr. Greenberg: The chest film in the recumbent position shows a homogeneous density in the lower two-thirds of the right lung field compatible with pleural reaction (fig. 1). The right hemidiaphragm cannot be defined.

Dr. Steigmann: This chest film does not at all resemble the involvement of the chest after pleuropulmonary involvement by amebic abscess. It simply shows fluid filling the right hemithorax. In view of these films, I would be inclined to consider perforated peptic ulcer or appendicitis leading to peritonitis and to a subdiaphragmatic abscess, with resultant reactive pleurisy with effusion. Then the cough and expectoration would have to be incidental. Radiologically, amebic abscess of the liver is usually associated with an elevated diaphragm.

Dr. Harold Schoolman: What is the magnitude of the anemia in amebic abscess?

Dr. Steigmann: Many patients have this type of anemia.

Clinical Diagnosis.—The clinical diagnosis was amebic liver abscess, amebic empyema with bronchopleural fistula, and amebic lung abscess.

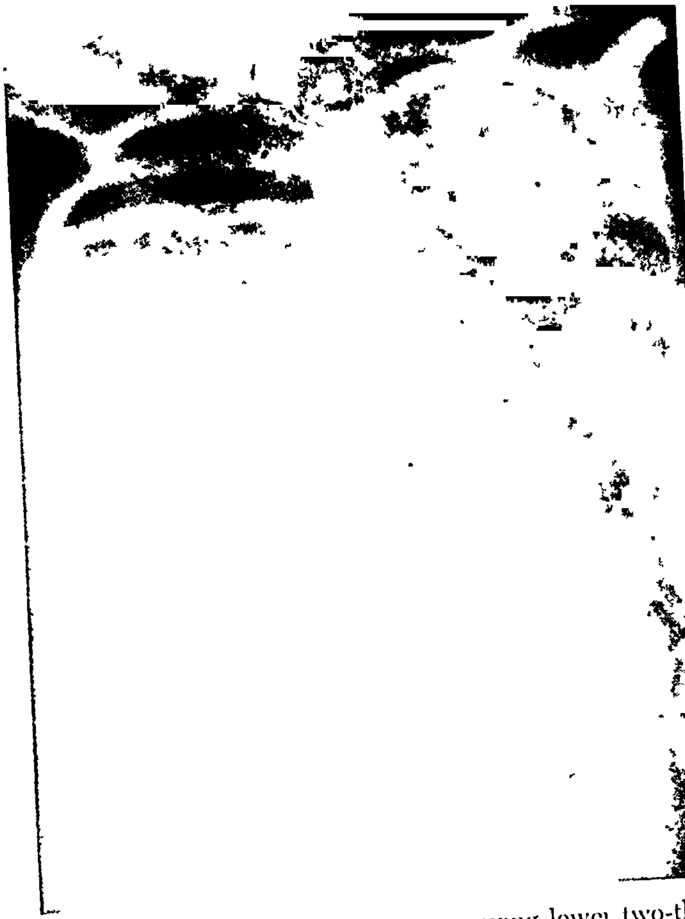

Fig. 1.—Homogeneous opacity occupying lower two-thirds of the right hemithorax.

Pathologist's Report

Dr. Paul B. Szanto: At autopsy the body was that of an emaciated woman. A sinus tract in the eighth intercostal space drained brown-gray material. This was not mentioned in the clinical history.

Dr. Steigmann: In view of this, one should reconsider the possibility of fungus infection.

Dr. Szanto: The peritoneal cavity contained 200 cc. of amber fluid. Focal necroses were present in the adrenal cortex. The liver was enlarged (1,900 Gm.). Its surface was smooth; the right subdiaphragmatic space was obliterated by dense fibrous bands which fixed the superior surface of the right lobe of the liver to the diaphragm. The upper two-thirds of the right lobe of the liver was occupied by a large solitary abscess, measuring 14 by 10 by 8 cm., which contained thick brown-green fluid (fig. 2). The wall of the cavity measured between 1 and 2 mm. in thickness and was shaggy in appearance, being covered by shreds of necrotic tissue. In addition to this large abscess, a smaller cavity, closely resembling the larger one and measuring 8 cm. in its largest diameter, was found in the left lobe, extending toward the inferior surface. This abscess had perforated into the peritoneal cavity, but the site of perforation was sealed off by the stomach and transverse colon.

The abscess cavity in the right lobe of the liver extended to the diaphragm, and perforated through a rent measuring 3 cm. in diameter, extending into the pleural cavity. The perforation resulted in the formation of two encapsulated empyemas. One in the lateral portion of the pleural cavity drained through the sinus tract in the eighth intercostal space already described. A second encapsulated empyema at the lung base contained 200 cc. of thick gray pus. E. histolytica was isolated from the fluid obtained from the empyema. The basal part of the lower lobe was occupied by a cavity measuring 5 by 4 cm., communicating with the encapsulated empyema at the base of the lung. This cavity contained thick brown fluid, and was lined by shreds of necrotic tissue. The abscess was drained by a bronchus, which explains the large amount o expectoration. The lung parenchyma adjacent to th abscess showed in some areas atelectasis, in othe areas consolidation, with the histological appea ance of a chronic unresolved pneumonia. The r mainder of the lung showed edema and congestio The homogeneous opacity occupying the lower tw thirds of the right hemithorax was due to both t lateral and basal empyemas, and the intrapulmonary abscess surrounded by consolidated and atelectatic areas of the lower and middle lobes.

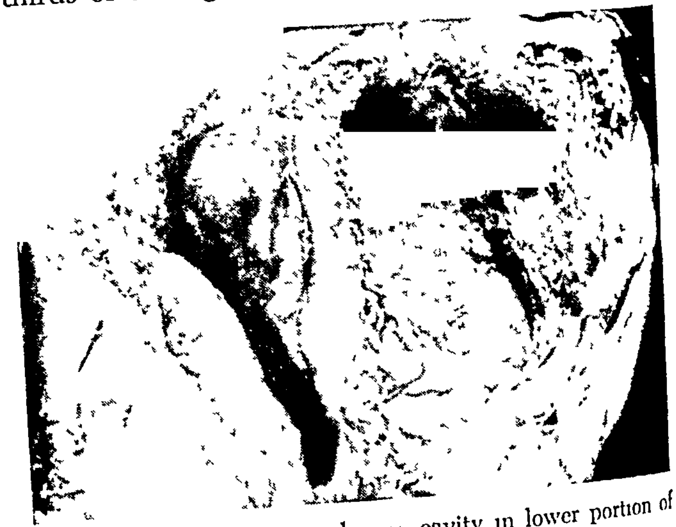

Fig. 2.—Large solitary abscess cavity in lower portion of the right lobe of the liver.

Microscopically, the liver, remote from the abscess cavity, showed an exaggerated lobular pattern with enlarged portal fields infiltrated by acute and chronic inflammatory cells. The wall of the cavity consisted of necrotic hepatic parenchyma and, adjacent to the zone of necrosis, involved the compressed liver cell plates. The abscess behaved like a tumor, causing pressure atrophy of the liver parenchyma. The wall of the cavity was heavily infiltrated by lymphocytes and macrophages (fig. 3). Trophozoites of E. histolytica were found chiefly at the border between the necrotic and the necrobiotic zones of the wall of the cavity.

. All the other organs were essentially normal with the exception of the spleen, which histologically showed evidence of infectious splenitis. The small and large intestines were normal except for moderate hyperemia of the mucosa of the cecum. Extensive histological studies, however, failed to reveal any pathological changes.

Pathological Diagnosis—The pathological diagnosis was hepatic amebiasis, with amebic abscesses in the left and right lobes of the liver; amebic empyema (right pleural cavity); and amebic abscess of the right lung.

Comment

Dr. Szanto: Amebiasis is transmitted by the cysts of E histolytica, which are swallowed and pass through the stomach and duodenum In the part of the small intestine where the pH is neutral or slightly alkaline, the cysts rupture, cytoplasm escapes (metacyst), and divides (metacystic trophozoites)[3] The trophozoites pass into the cecum where they may invade the mucosa, initiating the amebic tissue infection Although the cecum and ascending colon are the most commonly and severely affected sites in the large intestine (the appendix being only rarely involved), the rectosigmoid is second in frequency and intensity of involvement in cases of intestinal amebiasis. The incidence of hepatic and pulmonary complications has been mentioned by Dr. Steigmann.

In the case under discussion, we are dealing with amebic abscesses of the liver and lung, without morphologic evidence of intestinal amebiasis. There is little correlation, if any, between the degree of severity of clinical activity of intestinal amebiasis and the incidence of hepatic involvement. In some instances the intestinal process is quiescent[4] and amebas cannot even be detected in the feces. In other instances, as in our case, the intestinal amebiasis has practically disappeared. In the so-called carrier state, clinical symptoms at the site of intestinal involvement are not infrequently absent. Nevertheless, it should be stressed that at the time of origin of the hepatic involvement, an active intestinal process must have existed. Therefore, amebic infections should be considered prominently in the differential diagnosis of conditions involving the liver and the right lower lobe of the lung. Whether or not active diarrhea is present, one stool examination for amebas is not enough, because they are hard to find. Several should be made at intervals of two or three days and, as in our case, even a complete absence of intestinal involvement, with negative parasitological findings, does not rule out the possibility of amebic abscess of the liver. This is important since even very ill patients respond well to specific therapy with emetine or chloroquine. In this case, the anorexia, muscle aches, and fever were evidence of amebic hepatitis and abscess formation, and the lower costal pain, cough, and expectoration were the result of pulmonary extension.

Three types of hepatic involvement of the liver (hepatic amebiasis) have been distinguished: (1) hepatomegaly associated with amebic enteritis; (2) acute amebic hepatitis; and (3) amebic liver abscess.

In patients with intestinal amebiasis, the liver is frequently enlarged and tender. Microscopic changes are nonspecific, characterized by a moderate degree of fatty metamorphosis and focal necrosis. E. histolytica has not been demonstrated in the enlarged liver.

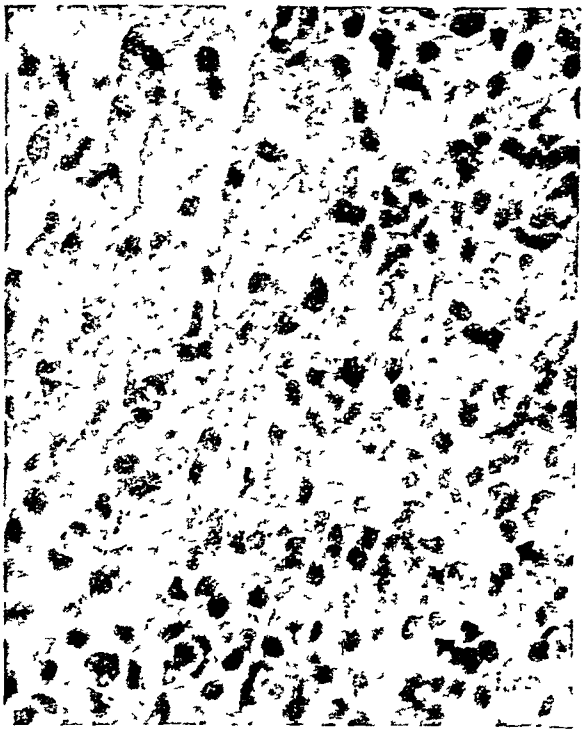

Fig 3—Infiltration of the wall of the abscess cavity and that of the adjacent compressed liver cell plates chiefly by mononuclear inflammatory cells

Acute amebic hepatitis is also characterized by diffuse enlargement of the liver, which is tender, and in some cases the patient is jaundiced and has fever. It is assumed that this is due to direct invasion of the hepatic parenchyma by E histolytica, which organisms reach the liver via the branches of the portal vein (E. histolytica erodes the small venules of the intestinal wall and is carried to the liver by the portal vein). Biopsy of the liver in this type of case reveals only nonspecific changes, characterized by focal necroses, liver cell damage, Kupffer cell proliferation, and infiltration of the portal fields by acute and chronic inflammatory changes; *it is now generally* assumed that amebic hepatitis is a diffuse hepatic disease, preceding (but *not necessarily followed* by) amebic abscess.

Amebic abscess is the result of cytological destruction of the hepatic parenchyma, without accumulation of polymorphonuclear leukocytes and pus formation. Hence, it is not an abscess *sensu strictiori*. E. histolytica is found in only about 50% of cases of amebic abscess in the proximity of the abscess.[1] The amebic abscess may be single or multiple. Most single abscesses are located in the right lobe just below the dome of the diaphragm, less frequently near the inferior surface. From 10 to 30% of these abscesses involve the diaphragm,[3] resulting in empyema, or pulmonary abscess, drained by a bronchial abscess near the lower surface of the liver. The abscess may rupture into the peritoneal cavity, colon, gallbladder, or through the abdominal wall.

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COUNCIL ON FOODS AND NUTRITION

AWARDING OF RESEARCH FELLOWSHIPS IN CLINICAL NUTRITION

Ten fellowships for research in clinical nutrition have been awarded by the Nutrition Foundation, Inc., and the Council on Foods and Nutrition. They have been given in honor of Dr. Paul György, recipient of the 1957 Joseph Goldberger Award in Clinical Nutrition. A fellowship is granted to a medical student to permit him to carry on research in some phase of clinical nutrition during the nonacademic portion of the school year. Each grant consists of $600. Application is made by a senior investigator, and the fellowship is administered by him. The Council was impressed with the interest shown in these fellowships and had a difficult time selecting 10 from the many meritorious applications submitted.

This fellowship program is a part of the joint effort of the Nutrition Foundation, Inc., and the Council on Foods and Nutrition to stimulate staff members and students of schools of medicine to take a more active interest in the science of nutrition as an integral part of medical practice.

The 1958 fellowships have been awarded for the following research:

1. Vitamin B_{12} absorption in the ileum. Senior investigator, Robert F. Schilling, M.D., Department of Medicine, University of Wisconsin.

2. Urinary sulfate excretion following L-cysteine administration as a test for pyridoxine deficiency in human subjects. Senior investigator, Walter G. Unglaub, M.D., Department of Medicine, Tulane University.

3. The biological activity of the "bound" niacin occurring in corn. Senior investigator, William N. Pearson, M.D., Division of Nutrition, Departments of Medicine and Biochemistry, Vanderbilt University.

4. Nutrient intake and nutritional status of children with sickle cell anemia in search for aberrancy, characteristic of the disease. Senior investigator, Roland B. Scott, M.D., Department of Pediatrics, Howard University.

5. The effect of ethanol on the deposition of fat in the livers of rats maintained on a diet with varying quantities of tryptophan and the efficiency of choline in protecting against this type of fatty infiltration. Senior investigator, George H. Nelson, Ph.D., Department of Biochemistry, University of South Dakota.

6. To test the hypothesis that the primary effect in phenylketonuria is improper utilization of tryptophan. Senior investigator, Robert C. Balderidge, Ph.D., Department of Physiological Chemistry, Temple University.

7. The necessity for ascorbic acid in the formation of hydroxyproline in the guinea pig. Senior investigator, George T. Lewis, Ph.D., Department of Biochemistry, University of Miami.

8. The utilization of iron in heme synthesis. Senior investigator, Dan A. Reichert, Ph.D., Department of Biochemistry, the State University of New York.

9. The effects of hydroxyaspartate and carbamylhydroxyaspartate on the growth of weanling rats. Senior investigator, H. J. Sallach, M.D., Department of Physiological Chemistry, University of Wisconsin.

10. Study of nutrition in Guatemala under the staff supervision of the Institute of Nutrition of Central America and Panama. Senior investigator, Henry Sebrell Jr., M.D., Institute of Nutrition Sciences, Columbia University School of Public Health.

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OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

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Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . "Medic, Chicago"

THE FIFTY-SIXTH ANNUAL REPORT ON MEDICAL LICENSURE

THE Council on Medical Education and Hospitals presents its annual compilation on medical licensure in this issue of The Journal. The report includes statistics concerning the medical examination and licensure of physicians in the United States and its territories and outlying possessions for the year 1957 as well as comparative figures for previous years. Also included is information pertaining to the current regulations for medical licensure. The officers of the examining and licensing agencies have been most cooperative in the submission of the current data and information essential in the compilation of a report of this nature, and for this assistance the Council is deeply grateful.

For the second consecutive year, the Federation of State Medical Boards of the United States has conducted an institute on the reevaluation of the licensing examination. The institute in 1958 covered four areas—bacteriology, pathology, anatomy, and surgery. These institutes take the form of annual workshops and have proved so successful that they will be continued in the future. The Federation takes cognizance of the radical changes in many aspects of education and practice and is making plans to be prepared for the effects such changes may have on the intent and interpretation of the various medical practice acts in the United States.

The Council's study makes reference to the Educational Council for Foreign Medical Graduates whose stated purpose is to provide information to foreign medical graduates, to translate and evaluate foreign educational credentials, and to test the foreign medical graduate's command of English and his basic knowledge of medicine. The program of the Educational Council in its entirety is included in a presentation by its executive director, Dr. Dean F. Smiley, which is also published in this issue of The Journal.

A new concept in medical licensure legislation is referred to in the description of the Healing Arts Act of Kansas.

Analysis of the statistical data and textual information reveals that in 1957 a total of 15,090 licenses to practice medicine and surgery were issued by 54 boards authorized by law to grant licenses to practice the art and science of medicine. The 15,909 licenses issued last year represented 7,604 granted after a successful written examination and 7,486 granted by reciprocity and endorsement of state licenses or the certificate of the National Board of Medical Examiners. There was an increase of 547 in the total number of licenses issued in 1957 as compared with the previous year. The number of licenses issued by examination increased 482 over the previous year, and the number issued by reciprocity and endorsement was increased by 65.

Licentiates of 1957 who received their first license to practice medicine and surgery during the calendar year and who represent additions to the medical profession numbered 7,455. In this group there were 1,014 foreign-trained physicians. In the same period there were approximately 3,500 deaths of physicians reported to the offices of the American Medical Association. Thus the physician population in the United States and its territories and outlying possessions was increased by about 3,900. Increases as compared with 1956 occurred in 25 states and Puerto Rico. Four states added more than 300 to their physician population; namely, Illinois, Ohio, Pennsylvania, and Texas.

Last year examination failures totaled 1,347. The total number of physicians examined was 9,116. The percentage of failures in the written examination of graduates from existing approved medical schools in the United States was 4.3%; of graduates of approved medical schools in Canada 11.3% failed; of the graduates of medical schools in the United States no longer in operation 25% failed; 78.6% of the graduates of unapproved medical schools at one time existing in the United States failed; the graduates of schools of osteopathy admitted to medical licensure examinations in several states had 16.9% failures; and 41.5% of the foreign-trained physicians examined for medical licensure last year failed. The total percentage of failures was 14.8%.

The report includes the preprofessional educational requirements of each licensing board, 37 boards indicated that the medical practice act makes it possible to accept for licensure examination graduates of approved medical schools who have compressed the usual four years or 128 weeks of undergraduate medical study into less than four calendar years recognizing the experimentation that is now being instituted by some medical schools, 7 boards indicated that it would be possible to obtain an interpretation of the medical practice act to accept graduates under these new programs, 8 replied that it would not be possible, one board was doubtful, and one board made no reply.

Other data included in the study includes the boards requiring an internship for licensure; regulations pertaining to the registration of interns and residents, licensure on the basis of government credentials, and licensure on the issuance of temporary and limited licenses; the schedule of written examination dates and reciprocity meetings; citizenship requirements; medical license fees; and annual registration requirements.

The licensure of foreign-trained physicians is specifically referred to in the first section of the report and reveals that graduates of 233 foreign medical schools and 5 licensing corporations were examined for medical licensure in 1957 by 37 states —Alaska, Hawaii, and Puerto Rico. Graduates of medical schools in the Philippines, Iceland, 16 South and Central American countries, 28 countries in Europe, and 14 countries in Asia were presented at examinations. There were 2,299 foreign-trained physicians examined, of whom 1,345 passed and 954, or 41.5%, failed. More than 50 graduates each from the universities of Habana, Mexico City, Bologna, Rome, Munich, and Geneva were tested in 1957, and more than 25 graduates of 18 other schools were examined. In 1957, the increase over the previous year was 516. In a five-year period, the report points out, there were 7,509 foreign physicians registered, 6,557 after written examination and 952 by endorsement of credentials.

The second section of the Council's report pertains to the results of examinations and endorsement of credentials sponsored by 22 boards of examiners in the basic sciences. These boards have no licensing powers. A certificate of proficiency is issued that is a prerequisite to eligibility to practice. Such certificates were issued after written examination to 4,024 individuals, and by endorsement of credentials 2,283 certificates were issued. The failure percentage in the written examination for those reporting this information was 17.3. A candidate in applying for a basic science certificate is not required by law to reveal his school of practice. The figures given, therefore, include graduates of all schools of the healing art. Kansas was added to the group of states maintaining a basic science board last year.

The final section of the report deals with exa
inations given by the National Board of Medi
Examiners. The examination of the National Boa
is given in three parts and may be taken during t
course of training in medical school. The boar
certificate is recognized by the medical licensi
boards of the United States, the District of Colu
bia and the territories, with the exception
Florida, Arkansas, Georgia, Indiana, Louisia
Michigan, North Carolina, and Texas. The purpo
of the National Board is to administer an examin
tion that may be accepted as an adequate qualific
tion for a medical license. It is not a national lice
ing board. There were 3,027 licenses to practi
medicine in 1957 issued by endorsement of t
certificate of the National Board by 47 boards
licensure. A number of medical schools use Nation
Board examinations for their own purposes. In so
schools the entire second year class takes part 1
the end of the second year; in others, part 2 serv
as a comprehensive examination at the end of t
fourth year; in still other schools both parts 1 a
2 are taken by all students.

PROGRESS IN HOSPITAL CARE

There is need for research in the type of ca
required by a patient in a hospital. This need l
the staff of the Mayo Clinic and Rochester Met
odist Hospital, with the support of several found
tions, to build a test-tube building specificall
designed for this purpose.

While the primary objective of a hospital is t
provide the best possible care for each patient, o
of the important associated considerations is t
provide that care for as little cost as possible. Ma
factors influence the efficiency with which a hos
pital performs its primary purpose, namely, care o
the patient. These factors include architectural de
sign of the hospital building, type of construction
materials used, distribution and availability o
needed medical facilities and supplies, and relation
ship between location of nurses' stations an
patients. Obviously, these factors influence cost

There are, of course, other important considerations. For example, not every patient in a given hospital requires the same degree and amount of attention and care. It is wasteful for a convalescent patient who will leave the hospital in a few days to occupy a bed which is surrounded with the equipment and personnel needed for a patient who is critically ill.

It is surprising to realize that many of the hospitals that have been built recently embody the same general characteristics of design and equip-

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The developmental team planning for the staged-care of patients
made up of Drs. O. H. Beahrs, O. T. Clagett, R. T. Patrick, and H. W.
Schmidt and H. C. Mickey, F. W. Schuster, and E. H. Weld.

ment that have been employed for many years. Although research has improved and expanded medical and surgical care of patients, little research effort has been directed toward the important problem of improving functions which are primarily the responsibility of the hospital. It is sincerely thought that such research is acutely needed and that it might be productive of significant contribution.

In December of 1955 a study was made by Mayo Clinic physicians to determine the type of nursing care required. The study included classification of over 1,100 patients, who represented a total of 7,519 hospital days during a one-week period in St. Marys Hospital in Rochester and Rochester Methodist Hospital. The professional staff, under whose care these patients were hospitalized for various types of medical and surgical conditions, divided the patient population into three categories: (1) those who were seriously ill and required constant care and observation, (2) those who required average hospital care, and (3) those who were well advanced in convalescence and needed only a minimum of attention. These observations revealed that constant care and observation was required 21% of the total "hospital days," average attention was necessary 59% of the time, and minimal convalescent care was adequate 20% of the time. Obviously, data of this type might reasonably influence type of hospital construction, distribution of personnel, placement of specialized equipment, and other practical considerations.

With the thought that hospital design can be more realistically related to the types of care required for patients having varying degrees and types of illness, it was decided to concentrate initially on design for the care of the acutely ill patient. It was thought that more direct control of the patient from the nurses' station was a prime requisite and could best be accomplished by a design which permitted constant direct observation.

This thought led to development of an architectural design which provides for the "special observation area" to be built in a circular form with private rooms on the circumference, and the nurses' station in the center. This design, which provides glass doors for each patient's room, permits direct observation of the patient by the nurse without aid of various technical devices, which are expensive in both initial cost and upkeep. Equally important may be the added security felt by the patient, who is able to see the nurses 15 feet away at the nurses' station. The use of single rooms permits care for both male and female patients in the same area.

A 12-bed unit, 67 feet in diameter, was completed in November, 1957. It is a temporary structure designed strictly for the purposes of research in hospital construction and function.

With this unit in use, the developmental team is continuing its planning for the staged-care of patients. A separate evaluation team is conducting controlled studies covering the following factors: time and motion, operational costs, and psychological reactions of patients, relatives, nurses, and doctors. Essentially, the studies cover the three basic elements in each stage of care, namely, equipment, personnel, and time.

In addition to the attempt to determine whether care in stages provides better care at less cost, it is hoped to prove whether the circle architecturally disciplines special observation and care to a greater degree than provided by conventional hospital design. The need for comparative studies is recognized, and they are under way.

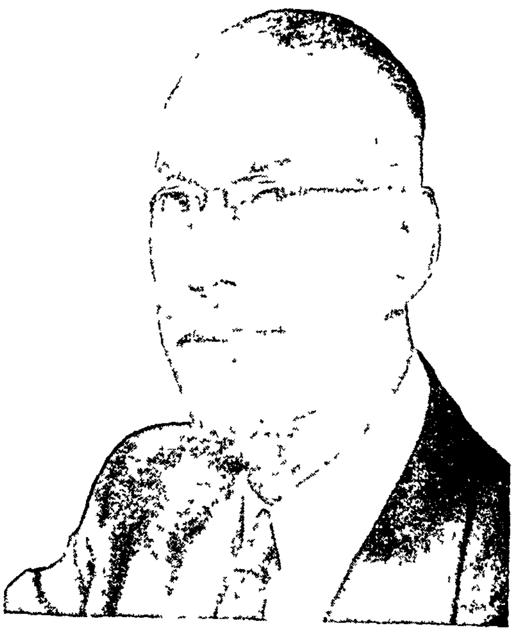
Hospital costs are spiraling, and there is an increasing shortage of nurses. Private insurance carriers, Blue Cross, government agencies, and others have led the way in developing a program to assist the public in meeting hospital costs. The time is at hand when equal effort should be directed toward factors influencing these costs, and, at the same time, toward means of improving medical and nursing care while substantially reducing costs.

NATIONAL YOUTH FITNESS WEEK

Elsewhere in this issue (page 634) is a Proclamation by the President of the United States dealing with the fitness of American youth. There is little to add to the President's statement, except to point out his emphasis upon the "mental, social, spiritual, and physical fitness of the youth of America to the end that we may assure the continuing strength and well-being of our Nation."

This is not only an objective which every physician can heartily endorse; it is one toward which the medical profession has been working for many years, in cooperation with educators, public health officials, and civic-minded groups. The medical profession believes in and endorses the President's broad program of general fitness for living. It stands ready as always to make its contribution to the health and fitness of the nation, to which a large percentage of the daily work of the practicing physician has always contributed.

The medical profession welcomes consultation and cooperation with other agencies working toward the same objectives. Such objectives will not be achieved by a week of more or less hectic agitation, publicity, and speech making. It is hoped that such a week may serve the purpose of calling attention to the objective, but this achievement will rest upon hard, sound, constructive, year-round cooperation.



THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

"Only a man of character can be a good doctor." Hippocrates believed this and thousands of physicians today are proving its truth in their lives and in their medical practices.

It is no secret, however, that the good name of high-minded men and women has been, and is being, besmirched by the unethical practices of a few physicians without character. Whenever I read or hear about an incident involving evil medical practice, I take it as a personal affront to myself, my colleagues, and organized medicine. I detest such conduct and I favor prompt exposure and strong disciplinary action by medical organizations.

In medicine we have developed an excellent disciplinary system to deal with such cases. We also have suitable censure measures to apply to those who deliberately corrupt medical practice. Nevertheless, in my opinion these are not enough. The machinery may be in readiness, but it takes the action of physicians to turn the wheels.

I believe that the two real keys to this whole issue of adequate professional discipline are (1) our desire to recognize and expose dishonest medical conduct and (2) our willingness to take the necessary action, whomever it may injure. Without these two keys we cannot operate the disciplinary machinery nor can we "apply the rod" and rid our ranks of the "bad apples" that spoil the good name of all medicine and its ethical practitioners.

As a profession that is constantly living and working in a goldfish bowl, we cannot merely admit that there are a few physicians who are unethical and then hope that our public apologies will restore the public's confidence in us. All medical organizations, large and small, must demonstrate dramatically that medical doctors will not tolerate corruption and that the wayward will be punished according to the severity of their offense.

Your A. M. A. House of Delegates last year admonished all physicians to be alert to this potential problem of dishonest practices when it adopted the following sentence in Section 4 of the new Principles of Medical Ethics: "They (physicians) should expose, without hesitation, illegal or unethical conduct of fellow members of the profession."

If we do anything less, we make a mockery of this sentence, this Section, and our entire set of Principles. If self-surveillance of the profession is not to be replaced by an outside agency, we must be sufficiently interested and willing to police our own ranks and to set due discipline.

Generally, organized medicine's record on the exposure of illegal or unethical conduct has been good. It can be better—indeed, it must be better. I do not advocate any Gestapo system, for I believe that physicians are close enough in their work to recognize when and where improper conduct and practice exists and to know the proper punishment in each case.

Any reluctance to reprimand an erring colleague does irreparable harm to our profession. Any use of a whitewash brush or of a broom to sweep dirt under the rug imperils our disciplinary system Any compromise with personal moral convictions damages the very character which makes a man or a woman a good doctor.

I believe that our conscience of medicine can be as important as our science and art of medicine. It gives us strength and prestige; it proves spiritual and practical values. It offers positive proof of the great earnestness and unsurpassed dedication of physicians to do right and to have all physicians above reproach in medical conduct.

Let us therefore continue to employ this conscience vigorously and effectively in our practice and in our disciplinary system just as we do our art and science in daily medical work.

David B. Allman, M.D.
Atlantic City, N. J.

MEDICAL LICENSURE STATISTICS FOR 1957

FIFTY-SIXTH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

The data in the following annual report on Medical Licensure Statistics have been compiled by the staff under the supervision of Mrs. Anne Tipner, Assistant to the Secretary of the Council on Medical Education and Hospitals.

Edward L. Turner, M.D., Secretary
Council on Medical Education and Hospitals

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INTRODUCTION

This report is the 56th annual compilation of information and statistics pertaining to medical licensure in the United States and its territories and outlying possessions by the Council on Medical Education and Hospitals of the American Medical Association. The report presents new developments in medical licensure and statistics for the medical examining boards of all states, the District of Columbia, Alaska, the Canal Zone, Guam, Hawaii, and Puerto Rico. The two homeopathic boards in operation, in Connecticut and Louisiana, had no new licentiates last year. Likewise, no physicians were licensed for civilian practice by the Virgin Islands last year. As in previous years, data are included pertaining to the 22 boards of examiners in the basic sciences and the National Board of Medical Examiners.

The compilations included in this study are based on data supplied by the examining boards and licensing agencies. The Council and The Journal express their appreciation to the officers of these boards who have cooperated in furnishing the information essential in the preparation of this report.

THE LICENSING EXAMINATION—REEVALUATION

The Federation of State Medical Boards continued in 1957-1958 its institutes on examinations. At the 1958 Congress on Medical Education and Licensure, institutes were held in four areas—bacteriology, pathology, anatomy, and surgery. It was demonstrated in these sessions that the idea of fitness testing can be applied to the preclinical sciences as well as to the clinical groups. Each of the four sessions had as chairman a physician with a background in the subject. The chairman proposed a series of questions designed to make the session a challenge to the examiners.

This was, indeed, the main objective of the 1958 institutes. After the first experience in 1957,[1] it was evident that one of the most desirable results of these conferences would be to awaken the examiner to the fact that he too was being evaluated to quite some degree by the person being examined. Thus, the type and quality of the examination itself becomes increasingly important. With four groups participating this year, the interest and attendance far surpassed that of the 1957 session.

The effort to reevaluate the licensing examination was in the beginning an experiment, but it was evident this year that it had also become an educa-

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In the descriptive data reference is made to the total number of boards for which figures are reported. The figures include the examining and licensing boards in the territories and outlying possessions.

tional venture for the examiner. The institutes thus represent the first concentrated effort in over 40 years to have the licensing examinations related to a specific area of medical education. It was necessary, in the beginning, to look back to what the medical schools are doing in examining the students as well as to look ahead to the specialized areas. Perhaps in no other way would it be possible for many examiners to realize the complicated progress of modern medical education.

TABLE 1.–*Licenses Issued, 1957*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	91	72	166
Arizona	20	93	113
Arkansas	81	27	108
California	554	1,613	2,167
Colorado	85	107	192
Connecticut	80	240	320
Delaware	13	15	28
District of Columbia	20	100	120
Florida	575	..	575
Georgia	233	97	330
Idaho	5	29	34
Illinois	366	249	615
Indiana	182	124	306
Iowa	136	59	195
Kansas	251	64	315
Kentucky	88	130	218
Louisiana	250	105	355
Maine	30	42	72
Maryland	310	195	505
Massachusetts	37	334	371
Michigan	277	211	488
Minnesota	208	158	366
Mississippi	125	32	157
Missouri	244	102	346
Montana	5	37	42
Nebraska	120	24	144
Nevada	..	15	15
New Hampshire	10	39	49
New Jersey	157	179	336
New Mexico	5	53	58
New York	278	1,097	1,375
North Carolina	214	75	289
North Dakota	15	8	23
Ohio	506	325	831
Oklahoma	174	40	214
Oregon	40	89	129
Pennsylvania	514	230	744
Rhode Island	37	33	70
South Carolina	81	38	119
South Dakota	16	32	48
Tennessee	174	96	270
Texas	375	218	593
Utah	20	45	65
Vermont	9	32	41
Virginia	254	120	374
Washington	70	142	212
West Virginia	24	75	99
Wisconsin	137	142	279
Wyoming	1	23	24
Alaska	5	16	21
Canal Zone	..	12	12
Hawaii	23	24	47
Guam	..	3	3
Puerto Rico	76	26	102
Totals	7,604	7,486	15,090

Reevaluation is mostly a matter of looking ahead. In 1959, at the Annual Congress on Medical Education and Licensure, the federation will sponsor four more institutes in physiology, biochemistry, preventive medicine and internal medicine. It is apparent now that with frequent changes in the membership of boards that annual workshops will be desirable, and it is anticipated that an "annual combined state board meeting" will be held every year preceding the Congress. The state boards will face the necessity for future consideration of some of the psychological and social science advances and methods which are now being introduced in some aspects of medical education—particularly in the selection of students. The federation has been aware, from the beginning of these studies, that some of the factors relating to fitness go back almost as far as the beginning of the education of the physician.

The federation will widen its interest in the fitness concept by understanding better the education of the physician and by improving its methods of approaching the determination of fitness. Anticipating that, in the years ahead, there will be some radical changes in many aspects of education and practice, the federation is making plans to be prepared for the effects such changes may have on the intent and interpretation of the various medical practice acts in the United States. A legislative committee has been formed in the federation to give counsel to state boards where changes are proposed in the state laws. One of the major objectives of this new committee is to prevent the introduction and passage of controversial and poorly conceived legislation.

The whole program of reevaluation is designed to remove the burden of educational testing from the responsibility of the examiners and to arrive at a point where the licensing examination will not have to be primarily concerned with educational backgrounds. The federation is cooperating in several ventures which will have a direct bearing on this—notably the Educational Council for Foreign Medical Graduates, Inc. However, its program of reevaluation is primarily concerned that the present 367 examiners on the various state boards become better qualified to examine and evaluate the candidates for licensure.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES

After several years of planning, the Educational Council for Foreign Medical Graduates began operation on Oct. 1, 1957. Its sponsoring agencies are the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Federation of State Medical Boards of the United States. The Board of Trustees of the Educational Council includes two representatives from each of these organizations and two members representing the public at large. Its stated purpose is to provide information to foreign medical graduates, to translate and evaluate foreign educational credentials, and to test the foreign medical graduate's command of English and his basic knowledge of medicine. Elsewhere in this issue, Dr. Dean F. Smiley, Executive Director, outlines in detail the purposes and functions of the Educational Council for Foreign Medical Graduates.

THE HEALING ARTS ACT OF KANSAS

The practice acts governing medicine, osteopathy, and chiropractic in the state of Kansas were repealed on July 1, 1957, and a new healing arts board, composed of members of each of these professions, replaced the three previous boards. The new act comprises 92 sections. Noteworthy are sections 9, 10, and 11, which state that licenses expire on June 30 of each year and may be renewed without examination. If renewal is not accomplished within 30 days thereafter, the license shall be suspended until an additional fee of $5 has been paid. After 90 days, a revocation order shall be issued, and reinstatement can be accomplished only upon recommendation of the board. Beginning with section 12, the act provides that the governor shall appoint a healing arts board consisting of five members who hold a degree of doctor of medicine from an accredited medical school, are residents of Kansas, and have been actively engaged in the practice of medicine and surgery in the state of Kansas under licenses issued in the state for a period of at least six consecutive years immediately preceding their appointment. Three shall be osteopathic physicians and three chiropractors.

The act provides for licensure by written examination and by endorsement of credentials. Section 36 specifies that a license may be revoked or suspended citing 11 acts or offenses, many of which are similar to the causes for withdrawal of registration in effect by the medical practice acts of other states. One unique feature is that a license may be revoked or suspended for failure to take some form of postgraduate work each year as required by the board. The act further specifies the classes or persons who are exempt from the provisions.

In addition to the Board of Healing Arts, the act provides for a Board of Basic Science Examiners, and applicants for licensure must possess a certificate of proficiency in anatomy, physiology, chemistry, bacteriology, and pathology from this board before obtaining licensure; this certificate can be obtained either by examination or endorsement.

All licenses issued prior to the taking effect of this act (July 1, 1957) continue in full force and effect but must be renewed under the provisions of the new law.

MEDICAL LICENSURE STATISTICS

The tables referring to medical licensure include figures for the number of candidates examined for medical licensure in 1957 and also for those licensed on the basis of reciprocity or endorsement of credentials. Other data are also included pertaining to the regulations for medical licensure both of physicians who secured their professional training in the United States and Canada and of physicians educated in other countries. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL EXAMINERS

Licenses Issued

During 1957 there were 15,090 licenses to practice medicine issued by 54 legally constituted medical examining boards granted authority to issue licenses to practice medicine and surgery. The number licensed by each board on the basis of written examination or by endorsement of credentials is shown in table 1. Of the 15,090 licenses issued, 7,604 were granted after written examination and 7,486 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners.

It does not follow that all physicians certified after written examination were tested in a given year. The licensing boards of 26 states, the District of Columbia, Alaska, the Canal Zone, Hawaii, and Puerto Rico require a year of internship as a prerequisite for licensure. A number of the boards permit the candidate for medical licensure to take the written examination after completion of the internship, and, if it is successful, the license is issued and dated on completion of the internship requirement. Licenses are also withheld in some states for other technicalities. As a rule, the licenses of those examined in December are dated and issued in the following year. The figures in table 1 will, therefore, not correspond with those in succeeding tables, which deal entirely with physicians examined for licensure in 1957, but they do include persons who may have been licensed in more than one state in a given year. In tables 10, 11, and 12 can be noted the number of physicians who secured their first licenses to practice medicine in 1957 and who thus represent additions to the medical profession in the United States and its territories and outlying possessions.

The greatest number of licenses issued in 1957, both by examination and by reciprocity and endorsement of credentials, was granted by California. This state issued 2,167 licenses, New York 1,375, Ohio 831, and Pennsylvania 744. More than 500 physicians were registered in Florida, Illinois, Maryland, and Texas. The fewest (15) were licensed in Nevada, while Delaware, Idaho, Montana, New Hampshire, North Dakota, South Dakota, Vermont, and Wyoming each issued less than 50 licenses. Among the territories and possessions, Puerto Rico licensed 102, Hawaii 49, Alaska 21, the Canal Zone 12, and Guam 3.

There was an increase of 547 in the total number of licenses issued in 1957 as compared with the previous year. The number of licenses issued by examination increased 482 over the previous year, and the number issued by reciprocity and endorsement was increased by 65.

Totals of the physicians licensed in 22 previous years and for 1957, both by examination and reciprocity or endorsement of credentials, are included in table 2. The variations shown for the years from 1936 to 1941, inclusive, were due to the increase in the licensure of foreign-trained physicians. The increases in succeeding years reflect the increase in the production of physicians, the mobility of physicians, as well as the licensure of foreign-trained physicians. In 23 years, 1935-1957, the number of medical licenses issued in the United States and its territories and outlying possessions totaled 267,246, of which 142,262 were issued after written examination and 120,984 by endorsement of credentials.

TABLE 2.—*Licenses Issued, 1935-1957*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
1950	5,454	6,755	12,209
1951	5,713	6,225	11,938
1952	6,212	7,016	13,228
1953	6,565	7,869	14,434
1954	6,827	8,202	15,029
1955	7,379	7,461	14,840
1956	7,122	7,421	14,543
1957	7,604	7,486	15,090
Totals	146,262	120,984	267,246

Candidates Examined by Medical Examining Boards

Compilations referring to those examined for medical licensure in 1957 by 54 licensing[2] boards are given in table 3. For each board is recorded the number who passed and failed, the medical school of graduation, the percentage of failures for each school and for each licensing board, the number of states in which graduates of a given school were examined, and the percentage of failures for each school and each state. Medical schools that are no longer in operation in the United States, unapproved medical schools in the United States, foreign faculties of medicine, and schools of osteopathy are not listed by name, but the numbers examined in each state in these four categories are included after those for existing medical schools in the United States and Canada.

During 1957 there were 9,116 applicants for licensure by written examination, of whom 7,769 passed and 1,347, or 14.8%, failed. The candidates examined represented 78 medical schools in the United States including Puerto Rico, 11 approved medical schools of Canada, 1 approved medical school in the United States no longer operating, 227 faculties of medicine of foreign countries, 5 unapproved medical schools in the United States that are no longer in existence, and 8 schools of osteopathy. Three schools had graduates for the first time in 1957—the University of Mississippi, the University of Missouri, and the University of Saskatchewan. No graduates of the latter school were examined for medical licensure in the United States in 1957. Osteopaths who were granted the privilege to practice medicine, surgery, or both by medical examining boards are included in these statistics. Osteopaths who obtain the legal right to special practice by other than medical examining boards are not included in these compilations.

Examination and reciprocity meetings are scheduled at frequent intervals by licensing boards in most of the states to facilitate licensure and enable physicians to commence the practice of medicine without undue delay. Later in this study there is included a tabulation giving the schedules for all states. The publication of the dates of examination and reciprocity or endorsement meetings is a regular biweekly feature of THE JOURNAL.

The 9,116 examinees included 6,244 graduates of approved medical schools in the United States, 185 graduates of approved medical schools in Canada, 4 graduates of an approved medical school in the United States that is now extinct; and 2,299 graduates of 227 faculties of medicine located in countries other than the United States and Canada; 42 graduates of unapproved medical schools in the United States no longer in existence, and 342 graduates of schools of osteopathy.

As in table 1, the 9,116 physicians and others examined do not represent an equal number of persons, since a candidate tested in more than one state in a calendar year is counted in each state; however, if a candidate failed more than once in a given state within the year, he is counted in that state as a single failure. Figures that show the number of individual licentiates added to the medical profession in 1957 are given in tables 10, 11, and 12.

The greatest number of graduates of any one school examined was 229, representing a public university, the University of Tennessee College of Medicine. Of the graduates of this school, 126 were tested in Tennessee and 103 in 13 other states. The greatest number examined from a private school was 194, representing Jefferson Medical College; they were tested in 20 states, including 112 who were examined in Pennsylvania, where the school is located. Twenty-two schools, including those named, had more than 100 of their graduates examined for medical licensure in 1957 as follows:

	No. of Examinees	No. of States in Which Examinations Were Taken
Public Medical Schools		
University of Illinois	179	19
Indiana University	156	6
State University of Iowa	110	8
University of Kansas	113	6
Louisiana State University	161	6
University of Michigan	[illegible]	10
University of Minnesota	124	6
Ohio State University	148	7
University of Tennessee	229	14
University of Texas	125	3
Medical College of Virginia	111	8
Private Medical Schools		
University of Miami	110	16
Emory University	117	5
Northwestern University	[illegible]	27
University of Louisville	121	10
Tulane University	170	9
St. Louis University	124	5
Washington University	113	9
Duke University	125	13
Jefferson Medical College	194	20
Temple University	130	14
University of Pennsylvania	112	17

Albany with 4 examinees, Boston University with 11, and Yale and Syracuse with 13 examinees had the fewest number of applicants for medical licensure by written examination before state boards. The majority of the graduates of these schools are licensed by endorsement of the certificate of the National Board of Medical Examiners. This is also true of other schools with small numbers of examinees.

Two schools in the United States had graduates for the first time in 1956-1957, the University of Mississippi and the University of Missouri. Twenty-five graduates of the University of Mississippi were examined in two states, and all passed. Graduates of the University of Missouri were also examined in two states; 31 were examined, and 5 (16.1%) failed. The University of Saskatchewan graduated its first class of students in 1957, but none appeared for licensure in the United States in 1957.

There were 185 graduates of 11 approved medical schools in Canada tested for medical licensure in 1957 by 34 boards. The figures are given for each licensing board by school in table 3 and the number examined by each board in table 4. Of the 185 candidates, 164 passed, and 21, or 11.3%, failed.

Graduates of foreign faculties of medicine were examined by 40 boards. There were 2,299 examined, of whom 1,345 passed, and 954, or 41.5% failed. Graduates of five unapproved medical schools were examined by five states. There were 42 examined, of whom 9 passed, and 33, or 78.6%, failed. Graduates of schools of osteopathy were tested in 12 states. Represented were 342 examinees, of whom 284 passed, and 58, or 16.9%, failed. Four graduates of an approved medical school no longer in operation were examined in one state, one of whom failed. Elsewhere (tables 10, 11, and 12) are given figures referring to actual licentiates and additions to the medical profession.

Failures in Medical Licensure Examinations

During 1957, as recorded in table 3, 1,347 of the 9,116 examinees for medical licensure failed. In table 6 are recapitulated the numbers examined in each state, the number who failed the examination, and the percentage of failures. Seventeen states had no failures among their examinees, 15 states failed less than 5%, 4 boards failed between 5 and 10%, while the percentage of failures in 14 states was more than 10%. It can be noted in referring to table 3 that those states with high percentages of failures examine a considerable number of foreign trained physicians and graduates of unapproved medical schools. The one exception is Florida. This state has no reciprocal provisions for medical licensure, and physicians planning semiretirement or full retirement in a more ideal climate seek licensure in these states. Many of these physicians have graduated from medical schools in the early years of the century and experience difficulty in writing examinations. Florida likewise examines graduates of unapproved medical schools.

In general, state licensing boards require the applicant to receive an over-all average of 75% and at least 60% in any one subject. In case of failure in not more than two subjects, the applicant is permitted a second examination in those subjects within 12 months. A few states consider such persons as conditioned in the subjects in which they fail. Conditioned candidates are not counted as failures in these statistics. When their grades are raised after a successful examination, they are recorded among those who passed.

Of the 15,090 persons obtaining licenses in 1957, 374 failed state board tests before obtaining a license. Of these, 196 had one previous failure, 65 had two failures, 44 had three failures, and 26 had four or more failures. Forty-two physicians had failures ranging from 1 to 15, while one physician had 34 failures before securing licensure. Of the 374 licentiates with previous failures, 351 were graduates of foreign medical faculties. A few of the state boards have no restrictions on the number of examinations that may be taken prior to licensure, but most states have a set limit of three examinations.

The following seven approved schools in the United States had no failures among their graduates in medical licensing examinations last year:

	No of Graduates Examined	No. of States in Which Examinations Were Taken
Stanford University	43	5
University of California, Los Angeles	29	1
University of California, San Francisco	77	6
Yale University	13	5
University of Mississippi	25	2
Albany Medical College	4	2
University of Utah	44	14

TABLE 3.—CANDIDATES EXAMINED

	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20	
Marginal Number	SCHOOL	Alabama		Arizona		Arkansas		California		Colorado		Connecticut		Delaware		Dist. of Columbia		Florida		Georgia		Idaho		Illinois		Indiana		Iowa		Kansas		Kentucky		Louisiana		Maine		Maryland		Massachusetts	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ALABAMA																																								
1	Medical College of Alabama, Birmingham	67	0															10	2	1	0																				
	ARKANSAS																																								
2	University of Arkansas School of Med., Little Rock					77	3											3	0	1	0													1	0						
	CALIFORNIA																																								
3	Coll. of Med. Evangelists, Loma Linda-Los Angeles							74	1	1	0							2	1			1	0													1	0	0	1		
4	Univ. of So. California School of Med., Los Angeles							67	0									0	1																						
5	Stanford University School of Med., San Francisco							39	0															1	0	1	0											1	0		
6	Univ. of California School of Med., Los Angeles							29	0																																
7	Univ. of California School of Med., San Francisco							71	0									1	0															1	0						
	COLORADO																																								
8	University of Colorado School of Medicine, Denver									60	0							3	0																					0	
	CONNECTICUT																																								
9	Yale University School of Medicine, New Haven																	8	0																						
	DISTRICT OF COLUMBIA																																								
10	Georgetown University School of Medicine															3	0	8	6	1	0							1	0					1	0			4	0		
11	George Washington University School of Medicine							1	0	1	0							6	2	2	0					2	0							1	0						
12	Howard University College of Medicine	4	0					5	1			3	1			3	1	1	0					1	3											1	0	47	4	0	
	FLORIDA																																								
13	University of Miami School of Med., Coral Gables																	33	1	25	0													2	0						
	GEORGIA																																								
14	Emory University School of Med., Emory Univ																	30	11	71	0																				
15	Medical College of Georgia, Augusta																	13	2	78	0																				
	ILLINOIS																																								
16	Chicago Medical School																	10	2					2	0									2	0						
17	Northwestern University Medical School, Chicago	1	0					7	0	2	0	1	0					11	3	1	0			43	7	4	0			1	0			9	0						
18	Stritch School of Med. of Loyola Univ., Chicago							6	1	2	0							5	0					36	3	2	0														
19	University of Chicago, The School of Medicine							4	0									5	0					5	1	3	0							1	0					1	0
20	University of Illinois College of Medicine, Chicago							17	0	1	0							12	1	1	0			113	7	2	0							1	0						
	INDIANA																																								
21	Indiana Univ. School of Medicine, Bloomington Indianapolis																	10	1					3	0	139	0					1	0	1	0						
	IOWA																																								
22	State Univ. of Iowa College of Medicine, Iowa City			1	0													5	2					1	0			97	0					1	0						
	KANSAS																																								
23	University of Kansas School of Medicine, Lawrence-Kansas City			1	0													4	1											99	0										
	KENTUCKY																																								
	University of Louisville School of Med., Louisville			1	0													13	4	1	0			2	1	2	0					93	0								
	LOUISIANA																																								
	State Univ. School of Med., New Orleans																	2	0															94	0						
	Louisiana School of Medicine,																	30	9					1	0									107	2						
	MARYLAND																																								
27	Johns Hopkins Univ. School of Med., Baltimore																	5	0	1	0			1	0					1	0							55	0		
28	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore													1	0			7	3																			83	2		
	MASSACHUSETTS																																								
29	Boston University School of Medicine																	4	3															1	0						
30	Harvard Medical School, Boston							7	0							1	0	12	1	1	0					1	0			1	0			3	0						
31	Tufts University School of Medicine, Boston																	5	2							3	0							2	0						
	MICHIGAN																																								
32	University of Michigan Medical School, Ann Arbor																	6	2					2	0									1	0						
33	Wayne State University College of Med., Detroit																	1	2					1	0																
	MINNESOTA																																								
34	University of Minnesota Med. School, Minneapolis																	3	1					3	0																
	MISSISSIPPI																																								
35	University of Mississippi School of Med., Jackson																	1	0																						
	MISSOURI																																								
36	University of Missouri School of Med., Columbia																	7	4																						
37	St. Louis University School of Medicine																							2	0																
38	Washington University School of Med., St. Louis																	8	2					5	0					2	0			1	0						
	NEBRASKA																																								
39	Creighton University School of Medicine, Omaha							9	0	3	0	1	0					1	2					1	0			3	0												
40	University of Nebraska College of Medicine, Omaha			1	0													2	1					1	0			1	0												
	NEW YORK																																								
41	Albany Medical College																	2	0															1	0						
42	University of Buffalo School of Medicine													1	0			8	4							2	0														
43	Columbia University College of Physicians and Surgeons, New York							1	0							1	0	10	1							1	0														
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		1			

P—Passed; F—Failed

25 Montana		26 Nebraska		27 Nevada		28 New Hampshire		29 New Jersey		30 New Mexico		31 New York		32 North Carolina		33 North Dakota		34 Ohio		35 Oklahoma		36 Oregon		37 Pennsylvania		38 Rhode Island		39 South Carolina		40 South Dakota		41 Tennessee		42 Texas		43 Utah		44 Vermont		45 Virginia		46 Washington		47 West Virginia		48 Wisconsin		49 Wyoming		50 Hawaii and Puerto Rico		Totals	Examined—Passed	Examined—Failed	% Failed	No. of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
												1	0																																							81	79	2	2.5	4	1
												2	1																															1	0							89	85	4	2.5	6	2
		1	0									0	1																					1	0											1	0					97	93	4	4.1	13	3
																																																		1	0	69	68	1	1.4	3	4
																																										1	0									43	43	0	0.0	5	5
																																																				29	29	0	0.0	1	6
																1	0																																	1	0	77	77	0	0.0	6	7
																		1	0																	1	0													1	0	69	67	2	2.9	7	8
														2	0																	1	0																			13	13	0	0.0	5	9
																		2	0					5	0																											31	25	6	19.4	8	10
														1	0									1	0															1	0											21	19	2	9.5	11	11
								2	0			11	9	1	0			1	0					7	0																											110	89	21	19.1	16	12
																																																				61	60	1	1.6	3	13
												1	1	1	0																																					117	105	12	10.3	5	14
																																																				93	91	2	2.1	2	15
												1	0															1	0																							18	16	2	11.1	5	16
2	0	1	0									2	1			2	0	9	0					6	0									5	1	1	0	1	0	1	0	3	0			5	0	1	0	1	0	138	126	12	8.7	27	17
								1	0			1	0			0	1	3	0			2	0											1	0							1	0			2	1					80	74	6	7.5	15	18
												2	0					2	0			1	0							1	0											1	0			1	0					32	31	1	3.2	14	19
												2	0			1	0	2	0			1	0	1	0									1	0							3	0							0	1	179	170	9	5.0	19	20
																																																		1	0	156	155	1	0.6	6	21
																								1	0									1	0																	110	108	2	1.8	8	22
												4	1									1	0																													113	111	2	1.8	6	23
																														1	0																					121	116	5	4.1	10	24
												0	1			1	0	1	0																																	101	100	1	1.0	6	25
								1	0							1	0							1	0									2	0															1	0	170	159	11	6.5	9	26
								1	0			3	1																											2	0											74	73	1	1.4	11	27
												2	0			1	0																																			99	94	5	5.1	5	28
								1	0																			1	0					0	1																	11	7	4	36.3	5	29
												2	0	4	0	1	0	1	0							1	0							3	0	1	0			1	1					3	0			1	0	53	51	2	3.8	21	30
														1	0									1	0									1	0																	16	14	2	12.5	7	31
												1	0					2	0					3	0																									1	1	206	202	4	1.9	10	32
																																																		3	0	68	65	3	4.4	5	33
																1	0							1	0																											124	123	1	0.8	6	34
																																																				25	25	0	0.0	2	35
																																																				31	26	5	16.1	2	36
												6	1																																					1	0	124	120	4	2.2	5	37
												4	0																																	1	0			1	0	113	111	2	1.8	9	38
	0	40	0					1	0															1	0									1	0															1	0	70	68	2	2.9	13	39
		77	1							1	0	0	1			1	0					0	1	1	0																					2	0					94	90	4	4.3	13	40
																								1	0																											4	4	0	0.0	3	41
										1	0	2	0	2	0									1	0									2	0											1	0					24	20	4	16.7	9	42
						1	0					0	1					1	0					1	0									6	0																	27	25	2	7.5	12	43
25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50							

TABLE 3.—CANDIDATES EXAMINE

Marginal Number	SCHOOL	Alabama		Arizona		Arkansas		California		Colorado		Connecticut		Delaware		Dist. of Columbia		Florida		Georgia		Idaho		Illinois		Indiana		Iowa		Kansas		Kentucky		Louisiana		Maine		Maryland		Massachusetts	
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19			
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	NEW YORK—continued																																								
44	Cornell University Medical College, New York			1	0			2	0	1	0			1	0			5	1					1	0									1	0	2	0	1	0		
45	New York Medical College, Flower and Fifth Avenue Hospitals					1	0	0	1			2	0					12	6							1	0							1	0					1	
46	New York University College of Medicine																	9	2					1	0							1	0	1	0	1	0				
47	State University of New York College of Medicine, New York City	1	0															7	2							1	0							2	0						
48	Univ. of Rochester School of Med. and Dentistry									1	0							1	2															1	0			1	0	1	
49	State Univ. of New York College of Med., Syracuse																	7	3																	1	0			1	
	NORTH CAROLINA																																								
50	University of North Carolina School of Medicine, Chapel Hill																	1	0															1	0						
51	Duke University School of Medicine, Durham	1	0			2	0											32	7	1	0					1	0														
52	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem																	10	2					1	0																
	OHIO																																								
53	University of Cincinnati College of Medicine																	8	2																						
54	Western Reserve Univ. School of Med., Cleveland																	8	1					1	0																
55	Ohio State University College of Med., Columbus			1	0													4	1					1	1																
	OKLAHOMA																																								
56	Univ. of Oklahoma School of Med., Oklahoma City	1	0															2	0					1	1					1	0										
	OREGON																																								
57	University of Oregon Medical School, Portland							9	0	1	0							1	0	1	0																			1	
	PENNSYLVANIA																																								
58	Hahnemann Med. Coll. and Hosp. of Philadelphia			1	0			1	0	1	0			1	0			7	3																						
59	*Jefferson Medical College of Philadelphia*							2	0					1	0	1	0	18	5	1	0	1	0	2	1	1	0							1	0						
60	Temple University School of Medicine, Philadelphia							2	0			1	0	1	0			13	2	2	0			1	0	1	0									1	0				
61	Univ. of Pennsylvania School of Med., Philadelphia							4	0	1	0					1	0	11	1															1	0			2	0	1	
62	Woman's Med. Coll. of Pennsylvania, Philadelphia							3	0									2	1					1	0									1	0	1	0				
63	University of Pittsburgh School of Medicine							1	0					1	0			5	2					1	0									1	0					1	
	SOUTH CAROLINA																																								
64	Medical College of South Carolina, Charleston																	8	0																						
	TENNESSEE																																								
65	University of Tennessee College of Med., Memphis	2	0	1	0	1	0											27	12	3	0			2	1							1	0								
66	Meharry Medical College, Nashville							1	0									2	1	35	0			2	1	1	0					1	0	1	0			1	1		
67	Vanderbilt University School of Medicine, Nashville											1	0					5	2																						
	TEXAS																																								
68	Univ. of Texas Southwestern Med. School, Dallas													1	0			1	0																						
69	University of Texas Medical Branch, Galveston																	1	1															1	0						
70	Baylor University College of Medicine, Houston																	1	1					3	1																
	UTAH																																								
71	University of Utah School of Med., Salt Lake City			1	0			11	0									1	0			1	0	1	0			1	0					1	0						
	VERMONT																																								
	niversity of Vermont College of Med., Burlington											1	0					1	0															1	0	1	0	1	0		
	VIRGINIA																																								
	Univ. of Virginia School of Med., Charlottesville																	11	0					1	0									1	0						
	Medical College of Virginia, Richmond			1	0													12	4	1	0																				
	WASHINGTON																																								
75	University of Washington School of Med., Seattle							6	0	2	0													1	0																
	WISCONSIN																																								
76	University of Wisconsin Medical School, Madison			1	0			3	1			1	0			1	0	2	2					1	0	2	0							1	0			1	0	1	
77	Marquette University School of Med., Milwaukee							7	0	2	0							4	2					3	1									1	0			1	0		
	PUERTO RICO																																								
78	Univ. of Puerto Rico School of Med., San Juan																																								
	CANADA																																								
79	Univ. of Alberta Faculty of Medicine, Edmonton							8	1			1	1																												
80	Univ. of British Columbia Sch. of Med., Vancouver							5	0																																
81	Univ. of Manitoba Faculty of Medicine, Winnipeg			1	0			6	1															1	0							1	0								
82	Dalhousie University Faculty of Medicine, Halifax			1	0							0	1																							2	0				
83	Queen's University Faculty of Medicine, Kingston							1	0									0	2					1	0													2	0		
84	Univ. of Western Ontario Fac. of Med., London															1	0	0	2																						
85	University of Ottawa Faculty of Medicine							1	0									1	0					1	0			1	0							1	0				
86	University of Toronto Faculty of Medicine			1	0			9	0									0	1					1	0			1	0							1	0	2	0		
87	McGill University Faculty of Medicine, Montreal							7	0	1	0	2	0			2	0	1	1			1	0			1	0							1	0						
88	University of Montreal Faculty of Medicine																																			1	0			1	
89	Laval University Faculty of Medicine, Quebec							1	3									1	0																	2	1				
90	Univ. of Saskatchewan College of Med., Saskatoon																																								
	OTHERS																																								
91	Foreign medical faculties	1	0	6	1			90	50	4	0	87	42	4	1	8	0	28	15	5	0	1	0	128	251	6	0	7	0	2	1					24	11	126	71	[illegible]	
92	Extinct medical schools																	3	1																						
93	Unapproved medical schools																	5	3					0	1																
94	Schools of osteopathy									5	0			1	0									2	9	5	0			144	16										
95	Totals	78		21		84		577		89		146		14		23		745		233		5		673		182		112		268		98		252		52		411			
96	Totals Examined Passed	78		20		81		517		89		101		13		22		575		233		5		383		182		112		251		98		250		40		[illegible]			
97	Totals *Examined* Failed	0		1		3		60		0		45		1		1		170		0		0		290		0		0		17		0		2		12		[illegible]			
98	Percentage failed	0.0		4.8		3.6		10.4		0.0		30.8		7.2		4.4		22.8		0.0		0.0		43.1		0.0		0.0		6.3		0.0		0.8		23.0		12.9			
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19			

P—Passed; F—Failed

25 Montana		26 Nebraska		27 Nevada		28 New Hampshire		29 New Jersey		30 New Mexico		31 New York		32 North Carolina		33 North Dakota		34 Ohio		35 Oklahoma		36 Oregon		37 Pennsylvania		38 Rhode Island		39 South Carolina		40 South Dakota		41 Tennessee		42 Texas		43 Utah		44 Vermont		45 Virginia		46 Washington		47 West Virginia		48 Wisconsin		49 Wyoming		50 Hawaii and Puerto Rico		Totals	Examined—Passed	Examined—Failed	% Failed	No. of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
						1	0	2	0			6	1					1	0					2	0									2	0											1	0					33	31	2	6.1	17	44
								3	0			8	2	1	0			2	0					3	0	3	0							4	1															1	0	55	45	10	18.2	17	45
												6	1																					1	0																	24	21	3	12.5	8	46
												3	1																					1	0															2	0	20	17	3	15.0	7	47
												3	2	2	0							1	0	3	0																					1	0			2	0	23	19	4	17.4	13	48
												1	0																																							13	10	3	23.1	4	49
														58	1																																					61	60	1	1.6	3	50
														80	0									2	0			1	0					2	0					1	0											125	118	7	5.6	13	51
														33	1																																					67	64	3	4.5	3	52
												4	1			1	0	79	0																															2	0	97	94	3	3.1	5	53
												8	2					68	0					1	0																									0	1	91	87	4	4.4	7	54
												3	1					34	0					1	0																	1	0									148	145	3	2.0	7	55
																				86	0																									1	0					94	93	1	1.1	7	56
																						32	0	2	0									1	0							3	0			1	0			1	1	63	62	1	1.6	13	57
								10	0			0	2					4	0					65	0																											95	90	5	5.3	9	58
								30	0			2	1					3	0					112	0	2	0							1	0									3	0					2	0	194	187	7	3.6	20	59
								3	0			2	1											95	0									1	0			2	0													130	127	3	20.8	14	60
								4	0			3	1	4	0									68	0									1	0			1	0			2	0									112	110	2	1.8	17	61
														1	0			1	0					17	0																	1	0			1	0					30	29	1	3.3	10	62
												1	0					3	0					76	0									1	0																	98	96	2	2.0	13	63
																												76	3																							90	87	3	3.3	3	64
																								1	0							126	0	2	0					1	0	1	0									229	216	13	5.7	14	65
												5	5					2	0					2	1							1	0											1	0	1	0					81	71	10	12.5	17	66
																		1	0													45	0																			56	54	2	3.6	6	67
												2	0																	1	0			89	3															1	0	99	96	3	3.0	7	68
																																		130	2																	135	132	3	2.2	3	69
												1	0																					79	2																	91	87	4	4.4	6	70
												2	0					1	0															1	0	15	0					2	0									44	44	0	0.0	14	71
												0	1											1	0													6	0	1	0					1	0					15	14	1	6.7	10	72
												0	2											1	0															76	1											93	90	3	3.2	6	73
														1	0																					1	0			78	0			12	0					1	0	111	107	4	3.6	8	74
								1	0			1	0					2	0					1	0									1	0							37	1									61	60	1	1.6	..	75
																						2	0	1	0									1	0			0	1							52	0			1	0	78	73	5	6.4	..	76
								2	0			1	0																			1	0	2	0							4	0			56	1					94	90	4	4.3	..	77
												5	2					1	0					1	0																									4	0	13	11	2	15.4	..	78
												1	0											2	0																					1	0			1	0	18	16	2	11.1	..	79
																																																				5	5	0	0.0	..	80
												2	1					1	0					1	0																											23	21	2	8.7	..	81
												2	0					1	0					1	0	1	0																									9	8	1	11.1	..	82
	0																							1	0																											9	7	2	22.2	..	83
																		1	0															1	0											1	0					10	8	2	20.0	..	84
																		1	0																																	9	9	0	0.0	..	85
												1	0					3	1					3	0																									1	1	33	30	3	9.1	..	86
												5	0	1	0			3	0					3	0									1	0	1	0			1	0	1	0			1	0					43	42	1	2.3	..	87
						1	0					1	3					1	0																			1	0													11	8	3	27.3	..	88
						1	0					2	1					1	0					1	0	1	0																									15	10	5	33.3	..	89
																																																				0	0	0	0.0	..	90
		1	0			5	3	86	7	3	2	268	323	1	2	2	1	86	73					15	0	36	1			13	0			34	9					91	46	9	0	7	1	7	0			72	8	2,299	1,345	954	41.5	..	91
																																																				4	3	1	25.0	..	92
												2	4															2	2																							42	9	33	78.6	..	93
						1	0	9	0			44	28					66	4															3	0											4	0					242	201	41	16.9	..	94
		121		0		13		164		7		847		218		17		569		86		41		515		45		86		16		174		402		20		12		302		71		25		147		1		118		9,118					95
		120		0		10		157		5		442		214		15		491		86		40		514		44		81		16		174		383		20		11		254		70		24		145		1		105			7,769				96
		1		0		3		7		2		405		4		2		78		0		1		1		1		5		0		0		19		0		1		48		1		1		2		0		13				1,347	14.8		97
0		0.8		0.0		23.1		4.3		28.6		47.8		1.8		11.8		13.7		0.0		2.4		0.2		2.2		5.8		0.0		0.0		4.7		0.0		8.3		15.9		1.4		4.0		1.4		0.0		11.0							98
25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50							

Forty-two schools had less than 5% and 13 had between 5 and 10% failures among their graduates. There were 16 schools with 10% or more failures in state examinations. The over-all figures and percentages for failures, if compared with the results of the National Board of Medical Examiners (appearing elsewhere in this study), show a very low percentage of failures (only 12 for all of part III) among graduates of medical schools in the United States.

TABLE 4.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1957*

	Examined	Passed	Failed
Arizona	3	3	0
California	43	38	5
Colorado	1	1	0
Connecticut	5	3	2
District of Columbia	3	3	0
Florida	9	3	6
Idaho	1	1	0
Illinois	4	4	0
Indiana	1	1	0
Iowa	2	2	0
Kentucky	1	1	0
Louisiana	1	1	0
Maine	8	7	1
Maryland	4	4	0
Massachusetts	1	1	0
Michigan	21	21	0
Minnesota	11	11	0
Mississippi	2	2	0
Missouri	2	2	0
Montana	1	1	0
New Hampshire	2	2	0
New York	19	14	5
North Carolina	1	1	0
Ohio	13	12	1
Pennsylvania	12	12	0
Rhode Island	2	2	0
Texas	2	2	0
Utah	1	1	0
Vermont	1	1	0
Virginia	1	1	0
Washington	1	1	0
Wisconsin	3	3	0
Hawaii and Puerto Rico	3	2	1
Totals	185	164	21

Registration by Reciprocity and Endorsement

The reciprocity and endorsement policies in medical licensure in the United States, Alaska, the Canal Zone, Guam, Hawaii, Puerto Rico, and the Virgin Islands are summarized in table 7. Florida is the only state that requires all applicants for licensure to pass a written examination. Hawaii and the Virgin Islands do not have reciprocal relations with any state, but Hawaii will endorse physicians certified by the National Board of Medical Examiners. Twenty-one boards require applicants for licensure to obtain a certificate from the board of examiners in the basic sciences of the state. In the section of this report pertaining to basic science boards is included a table outlining the reciprocity, endorsement, exemption, or waiver policies of these boards.

Twenty-nine states, Alaska, and Puerto Rico have reciprocal agreements with specific states. In 19 states, Canal Zone, and Guam, reciprocity is extended at the discretion of the licensing board. Twenty states, which have reciprocal agreements, also have similar discretionary powers to endorse applicants from nonreciprocating states who present credentials that correspond with those required by their respective states in the year issued. Also in this table is a column indicating the recognition accorded the certificate of the National Board of Medical Examiners.

Additional requirements, including professional practice, citizenship, oral examination and internship, and the fee for a license by reciprocity or endorsement, are also recorded. In some states, physicians of Canadian birth are exempt from the citizenship requirement. This is indicated by footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Other requirements or exemptions are indicated by footnote; footnote numbers are referred to in the miscellaneous column in the table.

This chart will be found helpful to physicians who are considering a change in location. The facts recorded in this table are intended to present merely statements of licensure policies. The information here given should be supplemented by direct communication with the licensing board. A list of the executive officers in charge of medical licensure appears elsewhere in this study.

The procedure in issuing licenses by reciprocity or endorsement varies. Some states entertain applications for licensure at any time, while others hold monthly, quarterly, or semiannual meetings. The policy in effect in each state is contained in table 23. In addition, THE JOURNAL publishes biweekly the exact dates when reciprocity or endorsement applications are considered.

The credentials presented by physicians granted licenses to practice medicine without written examination are given in table 8. There were 7,486 so registered on the basis of licenses from other states, the District of Columbia, the territories or outlying possessions of the United States, Canada and foreign countries, the certificate of the National Board of Medical Examiners, and by acceptance of service with an agency of the government of the United States. California issued the greatest number of licenses by this method. In this state 1,613 were

TABLE 5.—*Source of Candidates Examined for Licensure in the United States, 1957*

Medical Schools	No. of Schools	No. Examined	No. Passed	No. Failed	% Failed
Approved schools in United States	78	6,244	5,964	280	4.5
Approved in Canada	11	185	164	21	11.3
Extinct	1	4	3	1	25.0
Foreign	230	2,299	1,345	954	41.5
Unapproved schools	5	42	9	33	78.6
Schools of osteopathy	8	342	284	58	16.9
Totals		9,116	7,769	1,347	14.8

registered. New York licensed 1,097 by this method. Figures for other states were fewer than 400. Nine states licensed more than 200.

The largest number of candidates who presented the same type of credentials were the 3,027 diplomates certified by the National Board of Medical Examiners; 921 were licensed in New York, 585 in California, and 249 in Massachusetts. Other states registered fewer than 200. None were licensed on this basis in Arkansas, Florida, Indiana, Louisiana, South Dakota, and Texas.

There were 341 licenses issued in Illinois, 288 in Missouri, and 286 in Ohio presented to other states for reciprocal registration. More than 200 licenses from Maryland, Pennsylvania, and Tennessee were endorsed for reciprocal licensure. Licenses from every state with the exception of Nevada and Wyoming were used as the basis for registration by this method, ranging from 2 from New Mexico to 341 from Illinois.

Seven states registered 49 physicians by endorsement of credentials from one of the government services. Thirty-eight physicians were licensed by 12 boards on the basis of a license issued in Alaska, the Canal Zone, Hawaii, and Puerto Rico; twenty-one physicians were licensed by six boards on the basis of Canadian or foreign credentials.

Table 9 records the number of individual schools represented by the 7,486 reciprocity licentiates. With the exception of the University of Missouri, every approved medical school in the United States and 10 of the 12 approved medical schools of Canada had graduates licensed without written examination in 1957. The 7,486 physicians registered without written examination in the United States in 1957 included 7,164 graduates of approved medical schools in the United States. There were 240 graduates of New York University, 236 each from Columbia University and the State University of New York at New York City, 220 from Harvard, and 205 from Northwestern University licensed by reciprocity. In addition, 100 or more graduates of 24 other schools secured such licenses. Table 9 reflects the movement of graduates to states other than the ones in which they obtained their professional training or in which they first established their practice.

One hundred seventy-nine foreign-trained physicians obtained licenses by reciprocity or endorsement in 23 states, and 35 graduates of approved medical schools no longer in operation were registered by 21 states. Twenty-six graduates of unapproved medical schools secured licenses in 10 states, and 82 graduates of schools of osteopathy were registered to practice medicine, surgery, or both in 10 states. There were 322 represented in these four groups. There were 140 graduates of Canadian medical schools registered by 30 boards.

Licentiates Representing Additions to the Medical Profession

Figures for the number of physicians who secured their first license to practice medicine and surgery in 1957 and who therefore represent additions to the medical profession in the United States and its territories and outlying possessions are presented in tables 10 and 11. Included in these compilations are figures pertaining to candidates examined and licensed in 1957; candidates who were examined in previous years but to whom licenses were not issued until 1957 pending completion of a required internship, citizenship, or other technicalities; and physicians not previously licensed in any state but who were certified during the year on the basis of the certificate of the National Board of Medical Examiners. The figures also include phy-

TABLE 6.—*Failures in Medical Licensure Examinations, 1957*

State in Which Examined	No. Examined	No. Passed	No. Failed	% Failures
Alabama	78	78	0	0.0
Arizona	21	20	1	4.8
Arkansas	84	81	3	3.6
California	577	517	60	10.4
Colorado	89	89	0	0.0
Connecticut	146	101	45	30.8
Delaware	14	13	1	7.2
District of Columbia	23	22	1	4.4
Florida	745	575	170	22.8
Georgia	233	233	0	0.0
Idaho	5	5	0	0.0
Illinois	673	383	290	43.1
Indiana	182	182	0	0.0
Iowa	112	112	0	0.0
Kansas	268	251	17	6.3
Kentucky	98	98	0	0.0
Louisiana	252	250	2	0.8
Maine	52	40	12	23.0
Maryland	411	329	82	19.9
Massachusetts	97	37	60	61.9
Michigan	348	348	0	0.0
Minnesota	208	208	0	0.0
Mississippi	122	122	0	0.0
Missouri	256	248	8	3.1
Montana	5	5	0	0.0
Nebraska	121	120	1	0.8
Nevada	0	0	0	0.0
New Hampshire	13	10	3	23.1
New Jersey	164	157	7	4.3
New Mexico	7	5	2	28.6
New York	847	442	405	47.8
North Carolina	218	214	4	1.8
North Dakota	17	15	2	11.8
Ohio	569	491	78	13.7
Oklahoma	86	86	0	0.0
Oregon	41	40	1	2.4
Pennsylvania	515	514	1	0.2
Rhode Island	45	44	1	2.2
South Carolina	86	81	5	5.8
South Dakota	16	16	0	0.0
Tennessee	174	174	0	0.0
Texas	402	383	19	4.7
Utah	20	20	0	0.0
Vermont	12	11	1	8.3
Virginia	302	254	48	15.9
Washington	71	70	1	1.4
West Virginia	25	24	1	4.0
Wisconsin	147	145	2	1.4
Wyoming	1	1	0	0.0
Canal Zone	118	105	13	11.0
Totals	9,116	7,769	1,347	14.8

TABLE 7.—RECIPROCITY AND ENDORSEMEN

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by																													
		Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico
1	Alabama	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	Arkansas	+	+	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Connecticut	..	..	..	..	..	..	..	+	..	..	+	+	+	..	+	..	+	+	+	+	+	..	..	..	..	..	..	+	..	..
7	Delaware	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	Florida	No reciprocity or endorsement policies										..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	Illinois	+	..	+	+	+	+	..	..	..	+	..	..	+	+	+	+	+	..	+	..	+	+	+	+	..	+	+	..	+	..
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	Iowa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Kentucky	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	Louisiana	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+
18	Maine	..	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+
19	Maryland	+	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+
20	Massachusetts	+	..	..	+	..	+	+	+	..	+	+	..	+	+	+	+	+	+	+	..	..	..	+	+	+	+	..	+	+	..
21	Michigan	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+
22	Minnesota	+	+[12]	+	+	+[12]	+[12]	+	+	..	+	+[12]	+	+[12]	+	+[11]	+[12]	+	+	+	..	+	..	+	+	+	+	+	+[11]	+	+
23	Mississippi	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
24	Missouri	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	Nebraska	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	..
27	Nevada	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	..
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	New Jersey	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+
30	New Mexico	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32	North Carolina	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	..	..	+	..	..	+	+	+	+	+	+	+
34	Ohio	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
36	Oregon	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38	Rhode Island	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
39	South Carolina	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
40	South Dakota	+	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	..	+	+
41	Tennessee	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
42	Texas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
43	Utah	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
45	Virginia	+	+	+	+	+	+	+	+	13	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
46	Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
47	West Virginia	+	..	+	20	20	+	+	+	..	+	..	+	20	20	20	20	+	+	+	20	+	+	+	+	+	+	+	..	+	..
48	Wisconsin	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	+	+	..	..	+	+	+	..
51	Canal Zone	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
52	Guam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	Hawaii	No reciprocal relations..							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
54	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	+	..	..	..	..
55	Virgin Islands	No reciprocal relations..							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

This summary should be supplemented by direct communication with the

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Some states have [illegible] requirements for graduates of schools outside the United St[illegible]

+, indicates recip[illegible] relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board.")

1. D. Declaration of Intention of citizenship. ⊕, in citizenship column indicates full citizenship required, in other columns it implies a requirement.

2. In most cases there is a small additional recording or registration fee.

3. Year of practice after internship required.

4. Internship accepted in lieu of one year's practice.

5. Two years professional practice required.

6. All applicants must be graduates of a medical school approved by the American Medical Association.

7. Just preceding application.

8. Not required if applicant has been in practice more than 5 years.

9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.

10. Canadian citizens are required to file first papers.

11. Not applicable to citizens of Canada.

12 Oral examination required when application is based on a license dated five or more years prior to filing application.

13. For reciprocity applicants.

14. [illegible] required.

15. [illegible] Board of Medical Examiners $35

16. [illegible]iod of not less than three years immediately [illegible]tion.

17. [illegible]tion required.

18. [illegible]ination, certificate of National Board may be accepted in whole or in part.

19. Minimum fee.

20. Licentiates of California, Colorado, Indiana, Iowa, Kansas, Massachusetts, New York, and Rhode Island accepted on reciprocal basis at discretion of board.

21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in som

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sicians licensed on the basis of government credentials and Canadian and foreign licenses. The majority represent recent graduates.

The official figures indicate that 7,455 persons were added to the physician population in 1957 in the United States, Alaska, the Canal Zone, Guam, Hawaii, and Puerto Rico. By reference to table 1, it can be noted that 7,645 had previously been licensed. In 1957 there were about 3,500 deaths of physicians reported to the office of the American Medical Association. When this figure is deducted from the number licensed in 1957 for the first time, it will be seen that the net increase in the physician population in the United States and its territories and possessions was 3,900. This was an increase of 100 over figures for the preceding year.

	Reciprocates with, or Endorses Certificates Granted by																							Requirements						
Marginal Number	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Basic Science Certificate	Internship	Professional Practice	Citizenship	Fees, Dollars	Miscellaneous	Marginal Number
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1^{4}	⊕^{11}	50	42	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	^{16}	D	100	42	2
3	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	⊕	..	1^{4}	⊕	100	39	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+^{25}	..	⊕	0	⊕^{21}	100	12	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+^{9}	⊕	⊕	..	⊕	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	+	..	+	..	..	+	..	..	..	..	+	+	⊕^{8}	..	3^{16}	D^{10}	75	14, 42	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+^{5}	..	⊕	2	⊕	100	47	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+^{27}	⊕^{32}	⊕	1^{3}	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	⊕	..	..	⊕	..	..	9
10	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	..	+^{35}	..	..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	100	..	11
12	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	+^{17}	..	⊕	1	D	200	17, 42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	1^{4}	..	100	..	13
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	1^{4}	D	50	39, 6	14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	1$^{4, 7}$	⊕	50	28, 42	15
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	75	42	16
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	..	⊕	1^{4}	⊕$^{10, 40}$	50^{29}	42	17
18	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	..	..	..	+	..	⊕	1^{4}	⊕	52	..	18
19	+	+	..	+	+	+	+	+	+	..	+	+	..	+	+	..	+	+	..	+	+	+	+	..	..	1^{4}	D	50	42	19
20	+	+	..	+	+	..	+	+	+	..	+	+	+	+	+	..	+	+	..	..	..	+	+	..	..	0	D	50	..	20
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	⊕^{37}	⊕	1^{4}	⊕	100	34	21
22	+^{41}	+	..	+^{41}	+	+	+	+^{41}	..	+	+	+	..	+	+	+	+	+	+	+	..	+	..	⊕	..	0	⊕	100	11, 17, 42	22
23	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	..	⊕^{11}	50	..	23
24	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+^{27}	..	⊕^{33}	1^{4}	⊕	100	42	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1^{4}	⊕	75	14, 42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	⊕	..	1^{4}	⊕	50^{28}	..	26
27	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	⊕	⊕	1^{4}	⊕	200	14, 42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕^{11}	50	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	⊕	..	1^{4}	D	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2	D	40	..	31
32	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	..	..	..	0	⊕	100	42, 6	32
33	..	+	..	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	⊕	1	⊕^{11}	50	14, 42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	1^{4}	⊕	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕^{32}	⊕	1^{4}	⊕	100	11, 6	35
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+$^{9, 27}$	⊕	⊕	..	⊕	100	6, 42	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	2^{24}	D	100	42	37
38	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+^{14}	+^{14}	⊕	⊕	0	D	20	14	38
39	..	..	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	1^{4}	⊕	100	42	39
40	..	+	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	1	D	50	..	40
41	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	..	..	+	+^{30}	⊕	..	0	⊕	50	42	41
42	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	⊕	..	0	D	100	42	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	^{31}	..	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1^{4}	⊕	50	11	44
45	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+^{39}	+	..	..	2^{26}	D	100	42	45
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	0	..	25	..	46
47	^{20}	+	+	+	+	+	+	^{20}	+	+	+	+	+	+	+	..	..	+	+	+	+	..	+	..	⊕	0	⊕	100	..	47
48	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+^{14}	+^{18}	⊕	⊕	1^{29}	D	100^{9}	6	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+^{14}	+^{14}	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	110	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+^{22}	..	⊕	0	..	5	..	51
52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	..	50	6	52
53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	⊕	..	D	50	42, 6	53
54	..	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..	..	+	..	..	..	+$^{3, 39}$	+	..	⊕	1^{3}	⊕	30	..	54
55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	⊕	..	..	65	42	55

cretary of the licensing board of the state in which the physician is interested.

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ate or on proof of requirements similar to those required by Cali- rnia for graduates of foreign medical schools.

[22] At discretion of Health Bureau.

[23] Oral examination required if applicant's state requires it.

[24] If the applicant passes the examination in the state from which transfers after the completion of his internship, no practice is quired.

[25] May require oral examination.

[26] Internship accepted at the discretion of the board as the equiva- nt of two years' practice.

[27] Fee, $25.

[28] Fee same as applicant's state charges but not less than $50.

[29] A two year internship or a year of residency is accepted.

[30] Diplomates of National Board not required to have been in actice for three years.

[31] Same as required of candidates of state applying for licensure

[32] Not required for licensure by reciprocity.

[33] Reciprocity applicants only.

[34] Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.

[35] Applicants issued certificates prior to October, 1953, acceptable.

[36] Fee same as applicant's state charges but not less than $75

[37] For matriculants after Oct. 15, 1937.

[38] Graduates of foreign medical schools not accepted.

[39] Reciprocity extended at discretion of board to candidates whose qualifications would entitle them to admission to examination and who took examination equivalent to that required by this board.

[40] Permanent license withheld until completion of citizenship.

[41] At the discretion of the board.

[42] Graduates of foreign medical schools are not accepted for licensure by reciprocity.

[43] Reciprocity extended at discretion of board to states having comparable licensing requirements and which accept Colorado applicants on a substantially equal reciprocal basis.

[44] Consecutive years immediately preceding application.

In analyzing table 10, it can be noted that New ork had the greatest number of first licentiates, 95. Four other states added more than 300 to their hysician population; namely Illinois 360, Ohio 503, ennsylvania 537, and Texas 346. Increases as com- ared with 1956 [1] occurred in 25 states and Puerto ico. None were added in Nevada last year. The ost notable increases were in Connecticut, Iowa, New Jersey, Oklahoma, West Virginia, and Puerto Rico, while a marked decrease was evident in Nebraska.

The 7,455 licentiates representing additions to the medical profession in the last calendar year included 5,872 who secured their licenses by written examination and 1,583 by endorsement of credentials. The latter were mainly physicians holding

TABLE 8.—*Candidates Licensed by Reciprocity and Endorsement of Credentials, 1957*

Source of Former License or Credentials

Marginal Number...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
States Issuing Licenses by Reciprocity of Endorsement	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Govt. Services	National Board of Medical Examiners	Alaska, Canal Zone, Hawaii, Puerto Rico, & Philippine Islands	Canadian and Foreign	Special Endorsement	Total Licensed
Alabama	..	..	3	1	1	..	..	..	..	12	..	..	..	..	..	1	13	..	4	..	..	..	3	1	..	..	..	..	1	..	..	2	..	..	..	..	1	..	3	..	13	2	..	..	..	..	1	..	..	1	9	..	..	..	72
Arizona	..	..	1	8	6	..	..	..	..	1	..	5	1	4	2	..	1	..	3	2	8	9	1	2	..	2	..	..	..	..	..	1	..	3	1	..	2	..	2	1	2	2	1	..	1	2	..	3	..	..	16	..	..	..	93
Arkansas	..	..	..	1	1	1	..	..	..	..	..	4	1	..	1	..	4	..	1	..	..	2	1	2	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	4	1	..	..	..	1	..	..	..	..	..	..	..	..	27
California	3	3	3	..	33	3	1	5	8	12	4	137	37	23	23	23	19	3	36	5	72	67	2	71	2	32	..	..	3	1	29	7	8	100	13	19	51	1	2	6	22	31	15	1	16	18	1	31	..	22	585	4	..	..	1,613
Colorado	..	..	1	4	..	..	..	..	..	..	..	5	1	1	9	2	2	..	3	..	3	6	..	13	..	12	..	..	..	..	1	..	..	3	3	..	2	..	..	..	1	5	..	..	2	1	..	1	..	..	26	..	..	..	107
Connecticut	..	..	..	3	2	..	..	1	..	..	..	3	..	..	..	2	..	2	6	2	..	..	1	2	..	..	..	..	..	..	21	..	..	4	..	..	5	1	..	..	2	4	..	..	6	1	..	..	..	..	172	..	..	..	240
Delaware	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	15
District of Columbia	..	..	..	2	..	1	..	..	..	3	..	5	1	1	..	2	2	1	25	2	3	2	..	4	..	..	..	..	..	..	6	2	..	3	..	..	2	2	1	..	2	..	..	..	4	..	1	1	..	..	15	1	5	..	100
Florida	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Georgia	1	..	3	2	1	1	..	1	..	..	..	1	2	..	1	3	12	..	8	1	1	1	2	5	..	..	..	..	1	..	..	9	..	5	..	..	2	..	3	..	7	2	..	..	5	1	..	1	..	..	15	..	..	..	97
Idaho	..	..	..	2	3	..	..	..	..	..	..	2	..	1	3	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	2	..	..	1	..	1	..	..	9	..	..	..	29
Illinois	..	..	..	13	1	..	..	..	..	3	..	..	7	9	1	1	3	..	7	..	5	6	..	18	..	3	..	..	..	..	..	1	1	16	1	1	12	..	1	..	4	4	..	..	1	..	8	..	..	1	121	..	..	..	249
Indiana	..	..	1	4	2	1	..	..	1	3	1	15	..	2	4	5	4	..	10	..	5	3	1	8	..	2	..	1	..	..	3	..	..	14	..	..	4	..	..	..	2	2	..	..	4	..	..	5	..	..	..	17	..	..	124
Iowa	..	..	..	..	..	..	..	..	..	..	..	6	1	..	4	1	3	..	2	..	3	3	1	3	..	4	..	1	..	..	1	1	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	16	1	..	..	59
Kansas	..	..	1	..	..	..	..	..	..	..	1	3	2	4	..	5	..	..	1	1	..	..	..	19	..	8	..	..	..	..	..	1	..	4	2	..	1	..	..	..	2	1	..	..	..	..	..	..	..	..	8	..	..	..	64
Kentucky	..	..	5	3	..	..	..	..	..	4	..	1	4	1	2	..	7	1	2	..	2	3	7	5	..	..	..	..	..	..	2	..	..	12	2	..	2	..	1	..	30	4	..	..	2	..	..	..	..	..	27	1	..	..	130
Louisiana	6	..	7	3	1	..	..	..	..	6	..	3	..	2	2	3	..	..	5	..	1	..	9	2	..	..	..	..	..	..	5	5	..	2	5	1	2	..	4	..	10	16	..	..	3	..	1	1	..	..	..	..	..	..	105
Maine	..	..	..	..	..	3	..	1	..	..	..	..	..	..	1	..	..	..	..	5	..	..	..	1	..	..	..	1	2	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	25	..	..	..	42
Maryland	1	..	1	2	..	..	..	15	..	8	..	4	2	2	1	6	4	..	..	..	2	1	1	4	..	..	..	..	..	1	9	6	..	6	1	..	17	..	1	..	6	1	..	..	7	1	..	2	..	..	83	..	..	..	195
Massachusetts	2	..	..	3	..	2	..	1	..	4	..	..	..	1	1	3	2	1	7	..	..	..	..	1	..	1	..	3	3	..	2	2	..	10	1	..	10	8	..	..	3	2	1	3	5	..	..	3	..	..	249	..	..	..	334
Michigan	..	..	1	10	7	..	..	1	1	2	..	24	12	7	1	4	4	2	7	1	..	3	..	16	..	3	..	1	1	..	7	2	..	27	3	1	7	2	..	..	6	4	1	..	2	..	2	15	..	..	24	..	..	..	211
Minnesota	..	..	..	8	1	1	..	..	..	..	..	8	6	10	2	4	4	..	4	..	7	..	..	2	..	10	..	..	1	..	1	2	..	4	..	..	3	..	..	..	3	1	..	..	2	..	1	3	..	..	70	..	..	..	158
Mississippi	..	..	1	..	..	..	..	..	..	1	..	2	1	..	..	..	9	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	7	..	..	..	1	..	..	..	..	..	5	..	..	..	32
Missouri	1	..	5	2	..	..	..	..	..	..	..	4	1	1	27	4	3	..	2	..	2	..	..	..	..	..	..	..	1	..	..	2	1	3	4	..	1	..	..	..	8	4	1	..	1	..	..	2	..	..	22	..	..	..	102
Montana	..	..	..	2	3	..	..	..	..	..	..	..	..	1	3	1	1	1	..	..	4	1	..	4	..	4	..	..	1	..	1	..	..	1	2	..	..	..	..	1	..	..	2	..	..	1	..	..	..	..	3	..	..	..	37
Nebraska	..	..	..	..	2	..	..	..	..	..	..	1	..	6	2	2	..	..	..	1	1	1	..	3	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	24
Nevada	..	..	..	5	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	3	..	..	..	15
New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	5	..	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	1	..	..	1	..	..	..	..	..	..	22	..	3	..	39
ew Jersey	..	..	1	1	..	1	1	..	..	1	..	6	1	..	..	4	1	1	7	1	2	1	..	2	..	..	..	..	..	..	27	..	..	3	..	..	21	4	..	..	1	..	..	..	1	1	..	..	..	..	89	1	..	..	179
New Mexico	2	1	..	2	4	..	..	..	..	..	..	2	..	2	3	2	2	..	3	1	..	2	1	1	..	..	..	..	..	..	..	..	..	2	4	..	5	..	..	..	2	7	1	..	..	..	..	1	..	..	3	..	..	..	53
ew York	2	..	..	9	6	..	..	1	..	..	..	3	8	2	..	7	8	..	6	..	8	8	..	2	..	3	..	..	10	..	..	8	..	2	..	..	34	..	..	..	4	6	1	4	15	..	2	5	..	..	921	7	5	..	1097
orth Carolina	1	..	1	2	1	..	..	1	..	13	..	1	1	..	2	2	1	..	3	..	2	1	..	1	..	..	..	1	..	..	1	..	..	2	..	..	11	..	5	..	7	1	..	..	12	..	..	..	..	..	2	..	..	..	75
orth Dakota	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	8
hio	1	..	..	8	1	1	1	3	1	5	1	17	13	5	4	12	4	2	10	..	17	5	1	35	..	4	..	1	2	..	7	4	..	2	..	..	29	1	1	2	8	4	..	1	7	2	6	5	..	..	92	..	..	..	325
klahoma	1	..	1	2	1	..	..	1	..	1	..	2	1	..	3	..	1	..	1	1	..	..	2	2	..	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	5	5	..	..	1	..	..	..	..	..	6	..	..	..	40
regon	..	1	..	15	1	..	..	..	..	..	..	5	2	6	2	..	..	..	2	..	2	8	..	1	..	6	..	..	..	..	..	..	..	1	..	..	..	..	..	1	2	3	1	..	..	8	..	3	..	..	18	1	..	..	89
ennsylvania	4	..	..	4	..	2	..	1	4	2	..	11	1	1	1	1	4	..	10	1	6	2	..	6	..	2	..	..	6	..	9	2	..	13	..	..	..	..	1	..	2	6	..	..	6	1	1	1	..	4	114	1	..	..	230
Rhode Island	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	26	..	..	..	33
outh Carolina	..	..	..	1	..	..	..	..	..	6	..	1	1	..	..	..	3	..	1	..	1	..	..	..	..	..	..	..	..	..	1	11	..	1	..	..	..	..	..	..	4	..	..	..	2	..	..	1	..	..	4	..	..	..	38
South Dakota	..	..	..	1	1	..	..	..	..	..	..	1	1	3	..	..	1	..	..	..	2	9	..	2	..	7	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	32
Tennessee	3	..	4	3	1	..	..	..	..	4	..	2	..	..	1	4	4	..	9	2	1	3	19	2	..	1	..	..	1	..	2	3	..	3	1	..	1	..	2	..	..	4	..	..	2	..	1	..	..	..	13	..	..	..	96
Texas	2	..	7	10	1	3	..	1	1	3	..	24	..	1	6	8	34	..	5	3	6	4	3	25	1	5	..	..	..	..	5	3	1	6	11	1	10	1	3	2	12	..	..	..	2	3	..	4	..	1	..	..	..	..	218
Utah	..	..	..	8	..	1	..	..	..	..	..	4	..	1	1	2	..	..	3	..	..	..	..	2	..	1	..	..	..	..	..	..	..	4	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	1	14	..	..	..	45
Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	23	..	1	..	32
Virginia	..	..	2	2	..	1	..	3	..	3	..	..	1	1	..	1	3	..	9	1	..	2	1	2	..	..	..	..	1	..	4	9	..	5	..	..	4	..	3	..	14	3	..	1	..	..	1	..	..	..	42	1	..	..	120
Washington	..	..	2	9	2	..	..	..	..	1	..	5	1	6	3	..	2	..	7	..	3	18	5	5	..	16	..	..	..	..	2	..	..	2	3	3	1	..	..	..	3	..	1	..	3	..	..	..	..	..	31	2	6	..	142
West Virginia	..	..	..	1	..	..	..	..	..	..	..	3	..	1	1	2	2	..	4	1	2	..	..	1	..	..	..	..	1	..	3	3	..	4	1	..	12	..	2	..	2	2	1	..	9	..	..	..	..	..	17	..	..	..	75
Wisconsin	..	..	..	1	2	..	..	..	1	..	..	20	2	7	..	1	3	..	3	..	9	12	..	8	..	4	..	..	..	..	3	1	1	9	..	1	..	..	1	2	2	2	..	..	4	..	..	..	..	19	24	..	..	..	142
Wyoming	..	..	..	2	5	..	..	..	..	1	..	..	1	..	1	..	..	..	..	..	1	1	..	..	..	3	..	..	..	..	1	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	4	..	..	..	23
Alaska, Canal Zone, Guam, Hawaii, and Puerto Rico	..	..	..	1	..	..	..	1	..	2	..	..	..	..	1	..	..	1	4	..	1	..	..	3	..	1	..	..	..	..	3	..	..	..	1	..	..	..	..	..	1	3	..	1	..	2	..	2	..	..	51	1	1	..	81
Totals	[illegible]	5	51	161	[illegible]	[illegible]	[illegible]	37	18	101	7	341	113	113	110	110	170	17	224	30	183	188	61	288	[illegible]	137	0	9	47	[illegible]	100	90	14	280	62	30	205	21	39	15	207	130	[illegible]	13	127	46	26	[illegible]	0	40	3,027	[illegible]	21	0	[illegible]

the certificate of the National Board of Medical Examiners and using the certificate as the basis of licensure by endorsement of credentials.

Increases in the physician population arranged in nine geographical divisions in the United States are shown in table 11. The Middle Atlantic, East North Central, and South Atlantic groups had the greatest number of first licentiates—1,718, 1,466, and 1,262 respectively. More than 400 were added in four other groups—West South Central, 751; West North Central, 708; East South Central, 480; and New England, 459. The Pacific states added 380, the Mountain states 147, and the territories and outlying possessions 104.

In the past 23 years (1935-1957), 150,082 physicians have been added to the medical profession, as determined by the number who received licenses for the first time. Figures for each year during this period are presented in table 12. Of the 150,082 additions, 125,097 were licensed after a successful written examination and 24,985 by reciprocity or endorsement of credentials. The total number of licenses issued in the same period was 267,246.

Registration of Physicians, 1904-1957

A recapitulation of totals for 1957 and for all previous years since 1904 is included in table 13. This tabulation includes for each year the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials, and the total registered. The total number of physicians registered from 1904 to 1933 remained somewhat constant, except in 1918, when 4,231 were licensed, the lowest registration in 54 years. This decrease was due to a sudden withdrawal of physicians from civilian life in World War 1.

After 1933 there was an upward trend for a time, followed by a decline in the years 1940 to 1942 inclusive. There was a noticeable increase in 1943 as the result of the accelerated medical school curriculum and the efforts made to maintain civilian care during World War II at as high a level as possible while still providing for the needs of the military. In 1943 more physicians were registered than in any previous year. In the succeeding two years the total figure declined, but in 1946 there were 6,696 more registered than in 1943. Separation from service of a large number of medical officers and their subsequent licensure by endorsement of credentials indicating their return to private practice in states other than those in which they were licensed accounts in large part for the increase. This increase was also occasioned by the licensure of recent graduates who had entered military service on completion of the internship and before securing state licensure.

In 1904, the first year shown, the percentage of failures was 19.3. This was an era of proprietary medical schools. Beginning in 1913 the percentage of failures gradually dropped each year until 1930, when 5.7% failed. Beginning in 1936 the percentage of failures began to rise, reaching another peak of 20.7% in 1940. This was the result of the increase in the number of foreign-trained physicians seeking licensure in the United States, many of whom are not successful until after repeated attempts at licensure examinations. Since 1942 the percentage of failures has been somewhat reduced, although it still reflects the unsuccessful attempts of foreign-trained physicians, graduates of unapproved medical schools, and others. The increase in the number of foreign-trained physicians examined for licensure in 1957, described in more detail later in this study, accounts for the increase in the percentage of failures in 1957.

This table again refers to examinations given annually rather than to individuals examined. A candidate who fails more than once in a state in a given year is counted as one failure, but should he again fail in a succeeding year, this fact is computed among the failures for that year. Likewise, a successful candidate securing a license in more than one state in a given year is counted in both states and is likewise counted if he passed at examinations in later years. The figures in this table give only a fair approximation of the number of physicians added to the profession.

Graduates of Approved Schools and Others Registered, 1922-1957

Table 14 reflects for two categories the number of physicians registered since 1922. While prior to 1928 medical schools were classified by the Council on Medical Education and Hospitals of the American Medical Association as A, B, and C, for purposes of this table the schools are arranged in two groups. The figures in the first group include graduates of medical schools rated in class A and B prior to 1928 and schools classified as approved institutions since 1928. The second group refers to class C graduates, graduates of medical schools classified as unapproved since 1928, graduates of foreign medical faculties, and graduates of schools of osteopathy given recognition by medical licensing boards. In 1928, the classification of medical schools in A, B, and C groups was discontinued by the Council, and a list of approved medical schools has since been maintained.

In 1957 there were 15,255 candidates registered, of whom 13,330, or 87.4%, represented graduates of approved schools, and 1,925, or 12.1%, were in the second group. In the 36 years recorded in this table, 360,563 were registered, including 324,746 (90.1%) graduates of medical schools indicated as in the approved group and 35,817 others (9.9%).

TABLE 9—CANDIDATES LICENSED BY

Marginal Numbers	School	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine	19 Maryland
	Marginal Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	ALABAMA																			
1	*Medical College of Alabama, Birmingham*	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..
	ARKANSAS																			
2	University of Arkansas School of Medicine, Little Rock	3	1	..	4	1	..	..	..	..	3	..	..	1	..	1	5	7	..	2
	CALIFORNIA																			
3	College of Medical Evangelists, Loma Linda—Los Angeles	1	1	2	8	3	..	..	3	..	4	2	5	6	..	1	1	2	1	4
4	University of Southern California School of Medicine, L. A.	..	1	..	2	..	1	..	..	..	..	..	1	..	..	..	..	..	..	1
5	Stanford University School of Medicine, San Francisco	..	2	..	11	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..
6	University of California School of Medicine, Los Angeles	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	University of California School of Medicine, San Francisco	..	1	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
	COLORADO																			
8	University of Colorado School of Medicine, Denver	1	4	..	30	..	2	1	..	..	2	2	1	2	..	..	..	1	..	..
	CONNECTICUT																			
9	Yale University School of Medicine, New Haven	..	1	..	23	2	23	..	1	..	2	1	4	..	..	..	2	..	..	4
	DISTRICT OF COLUMBIA																			
10	Georgetown University School of Medicine	..	..	..	23	..	11	1	7	..	1	..	1	..	..	..	1	1	..	14
11	George Washington University School of Medicine	..	2	..	22	..	2	..	5	..	4	..	5	..	1	..	1	..	1	26
12	Howard University College of Medicine	1	..	..	22	..	1	..	12	..	..	..	..	1	..	..	..	..	..	2
	FLORIDA																			
13	University of Miami School of Medicine, Coral Gables	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	GEORGIA																			
14	*Emory University School of Medicine, Emory University*	2	..	..	6	..	..	..	1	..	2	..	1	..	..	..	2	2	..	2
15	Medical College of Georgia, Augusta	6	..	..	3	..	..	..	1	..	..	..	3	..	..	..	1	3	..	2
	ILLINOIS																			
16	Chicago Medical School	1	..	..	34	..	1	..	..	..	..	..	10	2	..	..	..	..	..	..
17	Northwestern University Medical School, Chicago	..	3	..	56	7	3	..	1	..	3	1	26	4	4	4	1	2	..	4
18	Stritch School of Medicine of *Loyola University*, Chicago	..	1	..	32	2	..	..	2	..	..	..	11	4	1	..	..	..	..	3
19	University of Chicago, The School of Medicine	1	1	..	9	2	3	..	2	..	..	..	15	..	6	..	..	..	..	1
20	University of Illinois College of Medicine, Chicago	..	8	1	89	..	1	..	2	..	..	2	17	8	..	1	1	2	..	..
	INDIANA																			
21	Indiana University School of Medicine, Bloomington-Indi'plis	..	1	1	40	1	..	..	..	..	1	..	7	..	1	2	4	..	..	1
	IOWA																			
22	State University of Iowa College of Medicine, Iowa City	..	2	..	25	1	..	..	1	..	..	1	9	2	2	..	..	1	..	2
	KANSAS																			
23	University of Kansas School of Medicine, Lawrence-K. City	..	2	..	25	8	..	..	1	..	1	3	1	4	4	..	1	2	1	1
	KENTUCKY																			
24	University of Louisville School of Medicine, Louisville	1	1	..	25	1	2	..	2	..	2	..	2	7	1	3	2	4	..	5
	LOUISIANA																			
25	Louisiana State University School of Medicine, New Orleans	3	..	1	4	1	..	..	2	..	3	..	1	..	1	..	3	2	..	1
26	Tulane University of Louisiana School of Medicine, New Orleans	12	2	4	14	1	2	..	..	..	8	..	2	3	2	..	4	4	..	1
	MARYLAND																			
27	Johns Hopkins University School of Medicine, Baltimore	1	2	1	10	1	4	1	3	..	1	1	2	6	..	..	1	3	..	4
28	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	1	1	..	18	2	1	..	10	..	7	..	5	1	1	1	2	3	..	6
	MASSACHUSETTS																			
29	Boston University School of Medicine	..	..	..	15	1	7	..	1	..	..	..	3	..	..	..	2	..	1	4
30	Harvard Medical School, Boston	1	4	..	40	2	14	1	1	..	3	..	3	..	1	1	5	1	3	3
31	Tufts University School of Medicine, Boston	..	2	..	30	1	14	..	1	..	4	..	1	..	2	1	..	..	11	..
	MICHIGAN																			
32	University of Michigan Medical School, Ann Arbor	..	4	..	46	3	1	..	2	..	..	..	6	2	..	1	2	1	1	2
33	Wayne State University College of Medicine, Detroit	..	4	1	22	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
	MINNESOTA																			
34	University of Minnesota Medical School, Minneapolis	..	4	3	48	5	1	..	1	..	3	..	4	2	1	..	3	..	..	..
	MISSISSIPPI																			
35	University of Mississippi School of Medicine, Jackson	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	MISSOURI																			
36	University of Missouri School of Medicine, Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37	St. Louis University School of Medicine	1	1	1	30	3	1	..	2	..	1	..	17	4	1	5	4	2	..	4
38	Washington University School of Medicine, St. Louis	..	..	1	35	2	2	..	1	..	3	1	6	..	2	8	1	..	1	1
	NEBRASKA																			
39	Creighton University School of Medicine, Omaha	1	3	..	23	2	1	..	..	..	..	1	1	..	..	12	1	1	..	..
40	University of Nebraska College of Medicine, Omaha	..	3	1	29	11	1	..	..	..	..	1	3	2	4	2	..	..	..	..
	NEW YORK																			
41	Albany Medical College	..	..	..	11	..	2	1	..	..	..	1	2	..	1	..	..	..	..	3
42	University of Buffalo School of Medicine	..	1	..	19	..	1	..	..	..	..	..	1	..	..	..	2	..	..	1
43	Columbia University College of Physicians and Surgeons, New York	..	2	..	37	6	18	..	1	..	2	1	1	..	1	..	4	1	2	6
	Marginal Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Guam, Hawaii, and Puerto Rico	Totals	Marginal Number
1	..	..	..	1	..	..	..	..	..	1	1	1	..	1	1	..	2	..	..	..	2	1	..	..	..	..	..	..	..	..	19	1
..	1	..	1	6	..	..	..	..	1	..	1	..	..	..	2	..	2	..	..	..	4	7	..	..	2	1	1	..	..	1	58	2
2	7	2	..	..	..	1	2	..	..	..	1	1	..	5	1	6	1	..	1	..	7	4	1	..	..	4	..	1	..	1	92	3
..	..	..	..	..	..	..	4	..	1	..	1	..	..	1	..	1	..	..	..	..	..	1	1	..	1	..	..	..	1	1	19	4
..	1	3	..	..	..	..	1	..	..	1	3	..	..	2	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	1	32	5
..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	6
2	..	1	..	..	1	..	..	..	..	1	4	..	..	..	..	1	..	..	1	..	1	1	1	..	1	1	..	..	..	1	21	7
..	7	..	..	..	1	1	1	..	..	3	6	..	..	..	1	1	..	..	..	1	..	1	..	..	..	1	..	1	5	..	76	8
7	1	4	..	..	..	..	1	..	1	1	22	..	..	6	..	..	8	..	1	..	1	..	1	3	2	..	1	..	..	2	125	9
12	2	6	1	1	..	..	..	..	11	..	33	1	1	3	1	..	6	3	..	..	1	..	..	..	13	..	..	2	..	2	159	10
1	2	3	..	..	1	..	..	1	3	..	12	..	..	5	1	1	11	1	1	..	1	..	1	1	14	3	2	2	1	4	141	11
2	7	..	..	1	..	..	..	..	1	..	7	1	..	7	..	..	3	..	..	..	..	..	..	..	1	..	..	1	..	..	70	12
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	13
3	..	..	..	..	..	..	..	..	..	..	..	7	..	..	..	..	1	..	2	..	2	2	..	..	..	..	..	..	..	..	35	14
..	..	..	..	..	..	..	..	..	..	..	..	2	..	5	1	..	1	..	4	..	2	..	..	..	1	..	..	..	1	1	37	15
..	..	1	..	..	..	..	..	..	7	..	41	..	..	4	..	..	..	..	..	..	..	1	..	..	..	1	..	2	..	..	105	16
2	3	8	..	2	2	1	..	1	..	3	8	..	1	9	2	5	7	..	..	2	3	8	7	..	1	6	2	1	..	2	205	17
..	6	2	1	..	..	..	..	..	..	..	3	..	..	4	..	1	2	..	..	..	..	1	..	..	..	1	..	11	..	..	88	18
4	8	4	..	1	..	..	..	..	3	1	20	1	..	1	..	1	5	..	..	..	1	1	1	..	..	3	..	2	..	..	112	19
1	6	9	1	4	..	..	..	..	8	1	8	..	..	9	..	1	5	..	1	2	3	3	..	..	..	1	1	10	..	1	142	20
1	8	4	1	1	..	..	..	..	1	..	9	1	..	14	1	1	1	..	1	1	..	1	..	..	..	..	..	2	1	..	108	21
2	8	9	..	2	1	2	..	..	..	2	1	..	..	1	..	7	8	..	..	..	..	2	2	..	1	6	1	6	..	..	102	22
2	1	2	..	25	3	1	..	..	..	3	..	2	..	4	2	3	..	..	..	..	..	3	..	..	..	5	1	..	1	1	113	23
2	1	3	1	2	1	2	1	..	1	2	9	2	..	11	..	..	1	..	..	..	3	..	1	..	1	..	2	1	..	..	105	24
1	..	2	1	..	..	..	..	..	..	..	8	..	..	1	1	..	1	..	1	..	..	9	..	..	2	..	1	1	..	..	46	25
2	3	2	7	3	1	..	..	..	1	1	5	1	..	1	..	..	2	..	1	1	4	22	1	..	1	..	..	1	..	1	120	26
4	8	3	2	2	..	..	..	..	3	1	8	1	..	8	..	1	7	..	..	..	6	2	2	..	3	3	1	..	..	2	98	27
3	..	1	..	..	..	..	..	..	1	2	7	1	..	6	..	..	2	..	1	..	1	3	1	2	3	2	4	2	..	3	104	28
34	..	2	..	..	..	..	..	8	2	..	19	..	..	4	..	1	1	3	..	..	2	1	..	1	1	..	1	..	..	..	109	29
51	1	4	1	3	..	..	..	6	4	..	30	..	..	8	..	3	3	..	..	..	8	3	1	5	2	3	1	3	..	2	220	30
55	2	..	..	2	..	..	1	3	4	..	17	..	..	6	..	..	6	6	..	..	1	2	..	..	1	1	3	1	..	3	181	31
..	3	5	..	2	..	..	..	..	1	..	7	2	..	11	..	1	6	..	..	..	1	6	..	..	..	4	2	9	..	2	133	32
1	1	2	..	..	2	1	..	..	..	..	1	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	42	33
..	2	..	..	..	1	1	1	1	..	1	6	1	..	5	..	2	1	..	..	6	..	1	..	1	1	12	..	6	1	2	127	34
..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	35
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	36
3	11	2	..	2	3	1	..	..	..	..	4	..	..	10	2	1	3	..	..	1	1	2	2	..	..	8	..	3	..	2	138	37
..	3	1	..	1	..	1	..	1	1	1	7	..	..	7	1	..	3	..	..	1	1	5	..	..	1	3	2	5	..	3	112	38
1	1	5	..	1	1	6	..	..	..	..	2	..	..	3	..	1	1	..	..	5	..	3	1	..	..	6	..	3	2	3	91	39
..	3	9	..	..	4	..	..	..	..	..	3	..	1	2	2	7	1	..	..	5	1	5	1	..	..	13	..	4	1	2	121	40
5	1	4	..	..	..	..	..	..	3	..	37	..	..	2	1	..	3	1	..	..	..	1	..	..	..	1	..	..	..	1	81	41
1	1	1	..	..	..	..	..	..	4	..	40	..	1	3	..	..	9	1	..	..	1	..	..	..	2	..	2	1	..	2	94	42
14	3	3	..	3	..	..	..	1	7	..	91	1	..	10	..	1	6	1	1	..	1	1	1	2	3	..	1	2	..	1	236	43
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

TABLE 9—CANDIDATES LICENSED BY

Marginal Numbers	Marginal Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland
	NEW YORK																			
44	Cornell University Medical College, New York	..	3	..	21	2	7	..	..	..	..	..	3	..	1	..	1	..	1	4
45	New York Medical College, Flower and Fifth Avenue Hospitals	1	1	..	41	1	20	..	..	..	..	..	2	..	1	1	2	..	1	8
46	New York University College of Medicine	1	2	..	44	..	13	..	..	..	1	1	4	..	1	1	2	2	..	9
47	State University of New York College of Medicine, N. Y. C.	..	..	..	32	..	13	1	..	..	..	..	1	..	..	..	..	1	1	3
48	University of Rochester School of Medicine and Dentistry	..	..	..	15	1	4	..	..	..	1	1	4	1	2	1	1	..	1	1
49	State University of New York College of Medicine, Syracuse	..	..	..	8	1	5	..	..	..	1	..	..	..	..	..	..	..	..	3
	NORTH CAROLINA																			
50	University of North Carolina School of Medicine, Chapel Hill	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
51	Duke University School of Medicine, Durham	3	1	..	16	..	1	..	..	..	1	..	1	..	1	..	3	3	1	2
52	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	1	1	..	2	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..
	OHIO																			
53	University of Cincinnati College of Medicine	..	1	..	25	2	1	..	..	..	1	..	4	3	1	..	7	..	..	2
54	Western Reserve University School of Medicine, Cleveland	..	1	..	26	1	..	..	1	..	..	..	6	4	2	2	2	1	..	1
55	Ohio State University College of Medicine, Columbus	..	..	..	41	..	..	..	1	..	2	..	5	2	..	1	1	1	..	1
	OKLAHOMA																			
56	University of Oklahoma School of Medicine, Oklahoma City	..	1	1	17	2	..	..	..	..	..	1	2	..	..	2	3	5	..	..
	OREGON																			
57	University of Oregon Medical School, Portland	1	1	..	30	1	..	..	..	..	..	3	..	..	..	..	..	1	..	..
	PENNSYLVANIA																			
58	Hahnemann Medical College and Hospital of Philadelphia	..	..	..	14	..	2	..	..	..	..	..	1	1	..	..	2	1	1	6
59	Jefferson Medical College of Philadelphia	1	1	..	25	3	5	2	..	..	1	1	4	1	..	1	1	..	1	8
60	Temple University School of Medicine, Philadelphia	..	..	..	20	1	4	1	..	..	1	..	4	..	..	..	1	1	1	1
61	University of Pennsylvania Sc[illegible] Philadelphia	1	1	2	29	3	2	2	2	..	1	..	4	3	..	1	1	2	..	4
62	Woman's Medical College of [illegible]	..	1	..	18	..	2	..	..	..	1	1	1	..	1	..	2	..	..	..
63	University of Pittsburgh Schoo[illegible]	..	..	..	13	..	..	..	..	..	1	..	3	1	1	..	..	..	..	4
	SOUTH CAROLINA																			
64	Medical College of South Carolina, Charleston	2	..	..	3	..	..	..	1	..	2	..	2	..	..	..	1	4	..	2
	TENNESSEE																			
65	University of Tennessee College of Medicine, Memphis	13	2	4	15	1	..	..	1	..	4	..	3	2	..	3	30	9	1	4
66	Meharry Medical College, Nashville	1	..	..	16	..	..	..	3	..	1	..	..	4	..	2	1	..	..	7
67	Vanderbilt University School of Medicine, Nashville	2	..	..	10	..	1	..	..	..	3	..	1	..	..	2	5	2	..	1
	TEXAS																			
68	University of Texas Southwestern Medical School, Dallas	..	..	..	6	1	..	..	..	..	1	..	..	..	..	..	..	5	..	..
69	University of Texas Medical Branch, Galveston	..	2	..	13	1	3	..	..	..	..	..	2	..	..	..	1	9	..	1
70	Baylor University College of Medicine, Houston	1	..	1	11	3	..	..	..	..	..	..	1	2	..	1	2	3	..	..
	UTAH																			
71	University of Utah School of Medicine, Salt Lake City	..	2	..	16	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..
	VERMONT																			
72	University of Vermont College of Medicine, Burlington	..	..	..	7	..	4	..	2	..	..	..	..	1	..	..	1	..	2	1
	VIRGINIA																			
73	University of Virginia School of Medicine, Charlottesville	..	1	..	10	1	3	1	1	..	4	..	1	2	..	..	2	..	..	5
74	Medical College of Virginia, Richmond	2	..	..	8	1	3	..	1	..	2	..	..	1	..	1	..	3	..	2
	WASHINGTON																			
75	University of Washington School of Medicine, Seattle	..	..	..	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WISCONSIN																			
76	University of Wisconsin Medical School, Madison	..	..	..	16	..	..	..	..	..	1	1	3	3	..	..	1	..	..	..
77	Marquette University School of Medicine, Milwaukee	1	3	..	22	..	1	..	2	..	..	..	6	4	6	..	..	1	..	1
	PUERTO RICO																			
78	University of Puerto Rico School of Medicine, San Juan	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	CANADA																			
79	University of Alberta Faculty of Medicine, Edmonton	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	University of British Columbia School of Medicine, Vancouver	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
81	University of Manitoba Faculty of Medicine, Winnipeg	..	..	..	9	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..
82	Dalhousie University Faculty of Medicine, Halifax	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	University of Ottawa Faculty of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
84	Queen's University Faculty of Medicine, Kingston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	University of Western Ontario Faculty of Medicine, London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	University of Toronto Faculty of Medicine	..	..	..	11	..	..	..	1	..	..	..	1	2	1	..	..	..	1	1
87	McGill University Faculty of Medicine, Montreal	..	1	..	16	..	3	..	1	..	..	..	..	..	..	..	..	..	2	1
88	University of Montreal Faculty of Medicine	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	Laval University Faculty of Medicine, Quebec	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	University of Saskatchewan College of Medicine, Saskatoon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																			
91	Foreign medical faculties	1	..	..	..	..	19	1	16	..	2	..	..	21	3	..	..	..	5	1
92	Extinct medical schools	1	1	..	10	..	1	..	..	..	..	..	..	..	..	2	1	1	1	1
93	Unapproved medical schools	..	1	2	5	..	..	1	1	..	..	1	..	..	..	..	..	..	..	..
94	Schools of osteopathy	..	..	..	..	9	..	1	..	..	..	..	..	9	..	..	..	..	..	..
95	Totals	72	93	27	1,613	107	240	15	100	0	97	29	249	124	59	64	130	105	42	18
	Marginal Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Guam, Hawaii, and Puerto Rico	Totals	Marginal Number
8	2	2	..	..	1	..	..	1	3	..	46	..	..	5	1	2	4	..	..	..	..	1	1	..	2	..	1	2	..	..	125	44
4	3	4	1	..	..	..	..	..	10	..	60	..	.	4	..	..	8	3	..	..	2	..	..	..	4	..	1	1	..	..	184	45
6	..	2	1	1	..	..	..	1	9	..	124	..	..	3	..	..	6	..	..	..	1	..	..	..	2	..	..	..	1	..	240	46
7	1	2	..	1	2	..	..	..	12	1	138	1	..	5	1	..	4	1	..	..	..	..	1	..	1	2	..	2	..	2	236	47
3	..	4	..	..	1	..	1	2	1	1	22	1	..	5	..	..	3	1	..	..	..	2	..	2	..	..	..	1	1	2	86	48
2	1	..	..	..	..	..	..	..	2	..	57	..	..	2	..	1	2	..	..	..	1	..	..	..	3	2	..	..	1	1	92	49
..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	6	50
3	1	1	..	..	..	..	..	..	..	..	7	7	..	1	1	..	2	..	4	..	2	3	3	..	4	..	1	..	..	..	73	51
3	1	1	1	1	..	..	..	..	..	..	2	..	..	1	..	..	..	..	4	..	..	..	..	..	1	..	1	..	1	..	25	52
2	7	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	2	..	..	2	1	3	3	..	..	72	53
4	6	2	..	2	..	..	..	..	1	2	3	1	1	1	..	..	5	..	1	..	1	3	4	..	1	1	..	2	..	..	88	54
2	7	1	..	1	1	..	..	..	..	..	3	..	..	..	..	..	3	..	..	..	1	2	..	..	2	..	1	1	..	..	80	55
1	3	..	..	4	2	..	1	..	..	4	..	..	1	1	1	..	..	..	..	..	1	12	..	..	..	3	1	..	..	2	71	56
1	1	1	..	..	1	..	..	..	..	..	..	..	..	1	..	20	..	..	..	..	..	2	1	..	..	7	..	..	..	..	72	57
3	1	2	..	2	..	..	..	..	9	1	9	..	..	3	..	..	9	..	..	..	..	5	..	..	2	..	3	1	..	1	79	58
5	4	..	..	1	1	..	..	..	15	..	14	1	..	7	..	..	12	..	..	1	2	2	..	..	2	2	4	1	..	1	130	59
7	3	2	..	1	..	..	..	..	2	..	15	1	..	5	1	1	12	2	2	..	..	..	..	1	..	1	3	..	1	1	96	60
9	6	3	..	2	1	..	..	..	10	2	13	5	..	11	..	..	8	..	3	..	1	1	1	1	2	2	2	1	1	..	143	61
1	..	..	..	..	..	..	..	..	1	..	12	1	..	1	..	..	8	..	..	1	..	..	..	..	2	1	1	1	..	1	53	62
3	1	2	..	..	..	..	..	..	1	1	4	1	..	4	1	..	2	..	..	..	..	1	..	..	2	..	4	..	..	..	50	63
..	..	..	..	..	..	1	..	2	..	..	1	6	..	1	..	..	1	..	..	..	1	3	..	..	3	..	2	..	..	..	38	64
2	4	2	6	7	..	1	..	1	..	3	2	4	..	4	5	..	..	..	4	..	10	9	..	..	10	2	2	2	..	2	174	65
2	6	..	1	3	..	1	..	..	1	1	1	2	..	6	..	1	3	..	..	..	2	4	..	..	2	1	..	1	..	..	73	66
1	..	1	1	1	..	..	..	..	..	..	5	3	..	4	2	1	..	..	..	..	3	5	..	..	3	1	..	..	1	..	59	67
..	..	1	..	..	..	..	..	..	..	1	..	..	..	2	1	..	..	1	..	1	2	..	1	..	..	..	..	..	..	..	23	68
..	3	1	..	1	..	..	..	..	..	5	2	..	1	..	2	..	3	..	..	..	1	..	..	..	2	..	2	1	..	1	57	69
2	..	..	..	2	..	..	..	..	..	2	2	..	..	..	2	3	3	..	..	..	1	..	..	1	1	..	..	2	..	2	48	70
1	..	..	..	1	2	..	1	..	..	..	3	..	..	..	..	1	..	..	..	..	..	..	4	..	..	..	1	..	2	..	36	71
8	1	1	..	..	..	..	..	1	1	..	24	..	..	4	..	..	..	3	..	..	..	1	..	9	1	..	..	..	..	..	72	72
2	..	1	..	2	..	..	..	..	..	..	13	5	..	3	..	..	2	..	..	..	4	2	..	..	3	1	1	3	..	..	73	73
4	..	3	1	..	..	..	..	..	1	..	3	7	..	6	1	..	4	..	2	..	2	1	..	..	1	1	8	..	..	..	69	74
..	..	..	1	..	2	..	..	..	..	..	1	..	..	..	..	1	1	..	..	1	..	1	..	..	..	12	1	..	..	1	37	75
1	7	4	..	2	..	..	..	..	..	..	3	..	..	3	..	6	3	..	1	..	..	3	..	..	..	..	..	10	..	..	68	76
3	7	1	..	..	..	..	..	..	1	1	7	1	..	1	..	1	2	..	..	..	1	1	..	..	..	..	1	4	..	2	81	77
..	..	..	..	..	..	..	..	..	..	..	8	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	9	19	78
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	79
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	80
..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	2	2	..	..	..	..	20	81
1	..	1	..	..	..	..	..	..	..	..	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	82
1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	6	83
..	1	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4	84
..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	85
1	..	..	..	..	..	..	..	..	..	..	5	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	26	86
5	4	1	..	1	1	..	..	3	..	1	9	..	1	1	1	..	..	1	..	..	1	2	1	1	1	3	1	..	..	..	63	87
..	..	..	..	..	..	..	..	2	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	88
1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	89
..	..	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	90
..	23	1	..	..	..	1	..	7	23	..	1	1	..	19	..	..	..	4	..	3	..	1	..	2	..	7	..	13	..	5	180	91
..	3	..	1	..	..	1	..	..	..	2	1	..	..	1	..	..	2	..	..	..	..	1	..	..	1	..	1	1	..	..	34	92
..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	11	..	..	..	1	..	2	..	..	28	93
4	..	..	..	..	..	..	..	2	10	..	..	..	..	10	..	..	..	..	..	..	..	32	..	..	..	..	..	3	..	..	80	94
334	211	158	32	102	37	24	15	39	179	53	1,097	75	8	325	40	89	230	33	38	32	95	218	45	32	120	142	75	142	23	81	7,486	95
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

Graduates of Unapproved Medical Schools Registered, 1953-1957

Graduates of institutions that were classified by the Council on Medical Education and Hospitals of the American Medical Association as unapproved were registered in 26 states, the District of Columbia, and the territories and outlying possessions in the past five years. Figures are reported separately in table 15 for those licensed after written examination and those licensed by reciprocity or endorsement of credentials. The table also includes a column combining the figures for these two groups. In

TABLE 10.—*Licentiates Representing Additions to the Medical Profession, 1957*

	Examination	Reciprocity and Endorsement	Total
Alabama	92	7	99
Arizona	11	1	12
Arkansas	78	0	78
California	113	134	247
Colorado	84	7	91
Connecticut	69	82	151
Delaware	7	0	7
District of Columbia	16	14	30
Florida	147	0	147
Georgia	224	1	225
Idaho	3	1	4
Illinois	305	55	360
Indiana	169	9	178
Iowa	124	5	129
Kansas	106	2	108
Kentucky	85	4	89
Louisiana	233	0	233
Maine	34	11	45
Maryland	281	18	299
Massachusetts	22	154	176
Michigan	261	6	267
Minnesota	173	23	196
Mississippi	122	1	123
Missouri	234	7	241
Montana	4	0	4
Nebraska	12	0	12
Nevada	0	0	0
New Hampshire	8	7	15
New Jersey	105	81	186
New Mexico	5	4	9
New York	231	764	995
North Carolina	208	1	209
North Dakota	6	0	6
Ohio	462	41	503
Oklahoma	94	0	94
Oregon	39	8	47
Pennsylvania	487	50	537
Rhode Island	41	14	55
South Carolina	77	1	78
South Dakota	16	0	16
Tennessee	167	2	169
Texas	346	0	346
Utah	20	6	26
Vermont	7	10	17
Virginia	241	2	243
Washington	69	17	86
West Virginia	20	4	24
Wisconsin	129	9	138
Wyoming	1	0	1
Alaska	1	0	1
Canal Zone	0	2	2
Hawaii	7	7	14
Guam	0	2	2
Puerto Rico	76	9	85
Virgin Islands	0	0	0
Totals	5,872	1,583	7,455

TABLE 11.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographical Divisions, 1957*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	34	11	45
New Hampshire	8	7	15
Vermont	7	10	17
Massachusetts	22	154	176
Rhode Island	41	14	55
Connecticut	69	82	151
Totals	181	278	459
Middle Atlantic			
New York	231	764	995
New Jersey	105	81	186
Pennsylvania	487	50	537
Totals	823	895	1,718
East North Central			
Ohio	462	41	503
Indiana	169	9	178
Illinois	305	55	360
Michigan	261	6	267
Wisconsin	129	9	138
Totals	1,326	120	1,446
West North Central			
Minnesota	173	23	196
Iowa	124	5	129
Missouri	234	7	241
North Dakota	6	0	6
South Dakota	16	0	16
Nebraska	12	0	12
Kansas	106	2	108
Totals	671	37	708
South Atlantic			
Delaware	7	0	7
Maryland	281	18	299
District of Columbia	16	14	30
Virginia	241	2	243
West Virginia	20	4	24
North Carolina	208	1	209
South Carolina	77	1	78
Georgia	224	1	225
Florida	147	0	147
Totals	1,221	41	1,262
East South Central			
Kentucky	85	4	89
Tennessee	167	2	169
Alabama	92	7	99
Mississippi	122	1	123
Totals	466	14	480
West South Central			
Arkansas	78	0	78
Louisiana	233	0	233
Oklahoma	94	0	94
Texas	346	0	346
Totals	751	0	751
Mountain			
Montana	4	0	4
Idaho	3	1	4
Wyoming	1	0	1
Colorado	84	7	91
New Mexico	5	4	9
Arizona	11	1	12
Utah	20	6	26
Nevada	0	0	0
Totals	128	19	147
Pacific			
Washington	69	17	86
Oregon	39	8	47
California	113	134	247
Totals	221	159	380
Territories and Possessions			
Alaska	1	0	1
Canal Zone	0	2	2
Guam	0	2	2
Hawaii	7	7	14
Puerto Rico	76	9	85
Totals	84	20	104
Grand Total	5,872	1,583	7,455

the main they represent five schools more recently in operation. At present there is no medical school in complete operation within the United States that is not approved by the Council on Medical Education and Hospitals.

There were 208 graduates of unapproved medical schools registered in the five-year period 1953-1957, 73 by examination and 135 by endorsement of credentials. In 1957 there were 9 licensed in 3 states by examination and 28 licensed in 12 states by reciprocity or endorsement of credentials. California, Florida, New York, and Texas licensed the greatest number of graduates of unapproved medical schools during this five-year period. In the remainder of the states shown there were fewer than 10 registered.

Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1953-1957

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery or both by 18 medical examining boards for five years (1953-1957) is given in table 16. There have been 1,430 such persons registered, 1,031 by examination and 399 without written examination. In 1957 there were 364 so registered, 284 by examination in 11 states, and 80 by reciprocity in 9 states. The new Healing Arts Act in Kansas provides for the licensure of osteopaths, and 144 were so registered in 1957. Following is a summary of the actions and regulations of the 18 boards providing for the licensing of osteopaths by the medical examining board.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1935-1957*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,695
1945	4,979	769	5,748
1946	5,362	1,608	6,970
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
1950	4,609	1,393	6,002
1951	4,985	1,288	6,273
1952	5,168	1,717	6,885
1953	5,388	1,888	7,276
1954	5,897	2,020	7,917
1955	6,211	1,526	7,737
1956	6,035	1,428	7,463
1957	5,872	1,583	7,455
Totals	125,097	24,985	150,082

In Colorado an osteopath receives a license to practice medicine and must meet the same requirements as for doctors of medicine. In Connecticut an osteopath registered by the osteopathic board may be licensed to practice medicine and surgery or both after examination by the medical examining board. Osteopaths in Delaware may be licensed as osteopathic physicians after successfully passing the examination of the medical board except that the principles of osteopathy is given in the examination in place of materia medica. The District of Columbia will permit any person engaged in the practice of osteopathy on or before Jan. 1, 1948, to file application for a license to practice osteopathy and surgery. To obtain such a license, osteopaths must pass all subjects of the medical examination and in addition must pass subjects in the practice of osteopathy.

TABLE 13.—*Registration of Physicians, 1904-1957*

Year	Examined	Passed	% Failed	Reciprocity or Endorsement	Total Registered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,976	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148
1950	6,203	5,481	11.6	6,755	12,236
1951	6,473	5,716	11.7	6,225	11,941
1952	7,028	6,229	11.3	7,016	13,245
1953	7,425	6,543	13.0	7,869	14,412
1954	8,066	7,033	12.7	8,202	15,235
1955	8,501	7,400	12.9	7,461	15,962
1956	8,342	7,179	13.9	7,421	14,600
1957	9,116	7,769	14.8	7,486	15,255

Since 1952, in Illinois, graduates of the Chicago College of Osteopathy are examined by the medical board and may receive medical licenses. In Indiana, under an amendment to the medical practice act in 1945, osteopaths are permitted to practice medicine, surgery, and obstetrics and to administer anesthetics, antiseptics, and narcotics. Persons who were licensed in osteopathy before 1945 may obtain from the medical board a license to practice osteopathy, surgery, and obstetrics. Special examination and licensure is provided by the Healing Arts Act passed in Kansas in 1957 for doctors of osteopathy actively engaged in practice in the state on Jan. 1, 1957, if application is made prior to July 1, 1960. An osteopathic physician having graduated from an approved college of osteopathy after June 1, 1950, and who holds a valid license to practice osteopathy may obtain licensure under the new healing arts act.

TABLE 14.—*Graduates of Approved Schools and Others Registered, 1922-1957*

	Graduates of Approved Schools[a]		Others		
Year	No.	Percentage of Total	No.	Percentage of Total	Totals
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
1950	11,502	94.0	734	6.0	12,236
1951	11,027	92.3	914	7.7	11,941
1952	12,198	92.1	1,047	7.9	13,245
1953	13,189	91.5	1,223	8.5	14,412
1954	13,814	90.7	1,421	9.3	15,235
1955	13,344	89.8	1,517	10.2	14,861
1956	13,146	90.0	1,454	10.0	14,600
1957	13,330	87.4	1,925	12.1	15,255
Totals	324,746	90.1	35,817	9.9	360,563

In Massachusetts, for the purposes of registration, the D.O. degree is considered equivalent to the M.D. degree. In New Hampshire, under the provisions of the medical practice act, osteopaths are granted the right to practice medicine and surgery. The New Jersey medical practice act provides that an osteopath licensed prior to Nov. 1, 1941, who has served for a period of two years as an intern or resident surgeon in an approved osteopathic or medical hospital, or has completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board, or has had at least three years of practice in a hospital approved by the board, can be admitted to an examination in pharmacology, therapeutics, and surgery. If successful, he can obtain a license to practice medicine and surgery.

In New York, a law approved April 10, 1946, provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics, and biological products, or any applicant who had met or would meet all the preliminary and professional requirements as of Sept. 1, 1936, and has satisfactorily passed or would pass the regular licensing examination would be granted the right to practice medicine without limitation.

The Ohio Medical Practice Act was amended in 1943 to provide that all graduates from osteopathic schools applying for the right to practice in the state must meet certain educational requirements and must pass certain examinations. One of the required examinations is in surgery. Those who qualify and pass all of the examination are then given a license to practice osteopathic medicine and surgery. Those in practice and licensed under a more limited law in effect prior to 1943 can secure a license to practice osteopathic medicine and surgery by meeting certain additional requirements, including postgraduate work and the passing of several additional examinations.

In Oregon, osteopaths who meet certain requirements are granted the right to practice in the subjects covered by the medical examination. In South Dakota, osteopaths may be licensed to practice medicine, surgery, and obstetrics. This is an unrestricted license. Texas issues only one license, which is unrestricted in scope. In Virginia, osteopaths may obtain the right to use drugs and to perform surgery with instruments. An osteopath must be examined in the same subjects as the doctor of medicine except, instead of being examined on the practice of medicine, osteopaths are examined on the practice of osteopathy, by the osteopathic member of the board.

The Wisconsin law, amended in 1950, provides that an osteopath licensed in the state may obtain a license to practice medicine and surgery by completing a refresher course in materia medica and pharmacology consisting of not less than 64 hours of lecture and 60 hours of laboratory work and by passing an examination in these subjects. Osteopaths not licensed in the state may apply to take the same examination as physicians. If successful, they will be granted licenses to practice medicine and surgery. In Wyoming, the statutes contain no specific provision for the licensing of osteopaths. The medical practice act provides that the certificate issued to all applicants shall be deemed a license to practice medicine in all branches in which the applicant has taken an examination.

that a broader background education may be obtained. In its "Function and Structure of a Modern Medical School" published jointly by the Council and the Association of American Medical Colleges, provision is made for the unusually intelligent and mature student who may be admitted to medical school under exceptional conditions after two years of college work. Statements regarding actual minimal preprofessional collegiate requirements for admission to each approved medical school are presented in the brochure on "Admission Requirements of American Medical Colleges, 1957-1958" prepared by the Association of American Medical Colleges.

TABLE 15.—*Graduates of Unapproved Medical Schools Registered 1953-1957*

	Examination						Reciprocity and Endorsement						Combined Total
	1953	1954	1955	1956	1957	Total	1953	1954	1955	1956	1957	Total	
Arizona	..	..	..	..	..	..	..	1	..	..	1	2	2
Arkansas	..	..	..	..	..	..	..	..	..	..	2	2	2
California	..	..	..	..	..	..	8	19	15	2	5	49	49
Delaware	..	..	..	..	..	..	..	..	1	..	1	2	2
District of Columbia	..	..	..	..	..	..	..	..	..	1	1	2	2
Florida	5	8	7	4	5	29	..	..	..	..	..	..	29
Georgia	1	2	..	..	..	3	1	..	..	..	..	1	4
Idaho	..	..	..	..	..	..	1	..	..	..	1	2	2
Illinois	..	..	..	..	..	..	..	2	4	..	..	6	6
Iowa	..	..	..	..	..	..	..	1	1	..	..	2	2
Maine	..	..	1	..	..	1	..	..	1	..	..	1	2
Massachusetts	2	5	1	..	..	8	..	..	..	..	..	..	8
Michigan	..	..	..	..	..	..	..	1	..	1	1	3	3
Missouri	..	..	..	..	..	..	2	1	..	1	1	5	5
New Hampshire	..	..	..	..	..	..	..	..	..	1	..	1	1
New Jersey	3	1	..	..	..	4	..	..	..	4	1	5	9
New York	3	3	1	5	2	14	..	..	..	1	..	1	15
Ohio	..	..	3	..	..	3	1	3	..	..	..	4	7
Pennsylvania	..	..	..	..	..	..	1	..	1	..	..	2	2
South Carolina	..	..	..	..	2	2	..	..	..	..	..	..	2
South Dakota	..	..	1	..	..	1	..	..	..	..	..	..	1
Tennessee	..	..	..	..	..	..	1	..	..	..	..	1	1
Texas	..	..	..	..	..	..	9	7	3	8	11	38	38
Virginia	2	..	..	..	..	2	..	..	..	..	..	..	2
Washington	..	..	..	..	..	..	..	..	..	..	1	1	1
West Virginia	3	..	..	..	..	3	..	..	..	..	..	..	3
Wisconsin	..	..	..	..	..	..	..	..	1	1	2	4	4
Territories and Possessions	1	2	..	..	..	3	..	1	..	..	..	1	4
Totals	20	21	14	9	9	73	24	36	27	20	28	135	208

TABLE 16.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1953-1957*

	Examination						Reciprocity and Endorsement						Combined Total
	1953	1954	1955	1956	1957	Total	1953	1954	1955	1956	1957	Total	
Colorado	8	3	7	1	5	24	15	22	16	12	9	74	98
Connecticut	2	3	..	..	..	5	..	..	..	..	..	..	5
Delaware	1	..	2	3	1	7	4	1	2	..	1	8	15
District of Columbia	..	..	..	..	..	..	..	1	1	..	..	2	2
Illinois	..	..	14	10	2	26	..	..	..	11	..	11	37
Indiana	5	2	6	2	5	20	10	11	9	..	9	39	59
Kansas	..	..	..	..	144	144	..	..	..	..	..	..	144
Massachusetts	..	1	..	..	..	1	1	2	5	4	4	16	17
New Hampshire	..	..	..	..	1	1	3	1	3	1	2	10	11
New Jersey	11	7	8	6	9	41	10	18	7	28	10	73	114
New York	47	44	92	42	44	269	4	1	1	4	..	10	279
Ohio	64	81	73	63	66	347	20	13	2	13	10	58	405
Oregon	..	..	..	..	..	..	1	..	..	2	..	3	3
South Dakota	..	1	..	..	..	1	..	..	..	..	..	..	1
Texas	32	46	25	9	3	115	16	13	10	13	32	84	199
Virginia	..	..	..	..	..	..	1	1	..	..	..	2	2
Wisconsin	7	7	6	6	4	30	..	1	1	3	3	8	38
Wyoming	..	..	..	..	..	..	..	..	1	..	..	1	1
Totals	177	195	233	142	284	1,031	85	85	58	91	80	399	1,430

Preprofessional Requirements of Licensing Boards

Since January, 1953, the minimum requirement for admission to an approved medical school has been three years of college preparatory study. The Council on Medical Education and Hospitals in accepting this minimum recommends for most students a full four-year college course in order

The preprofessional requirements of medical licensing boards are indicated in table 17. Seven boards specify that no preprofessional requirement is mentioned in the medical practice act. Ten boards reported a three-year requirement. In others, the law specifies at least two years of college work. No board specifies in detail the number of hours that must be devoted to the subjects of the premedical curriculum although seven boards report that the training must include certain subjects, such as English, physics, chemistry, biology, and a foreign language. The candidates appearing for medical licensure are graduates of all years, and the seeming lack of conformity with accepted standards as promulgated by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges is due to the fact initiation of the three-year requirement for all candidates appearing for licensure would eliminate the graduates of earlier years. In practice, the boards granting licensure to a graduate of an approved medical school accept the premedical training required in the year the candidate was admitted to medical school.

TABLE 17.—*Requirements of Preprofessional Training by Medical Licensing Boards*

Two Years or More of College

Alabama[1]
Arizona[2]
Arkansas[8]
California[8]
Colorado[1]
Connecticut[4]
Delaware[5]
Florida[6]
Georgia
Idaho
Illinois
Indiana[7]
Iowa[1]
Kansas
Kentucky
Louisiana[6]
Maine
Maryland[8]
Massachusetts[7]
Michigan[6]
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada[1]
New Hampshire
New Jersey[5]
New Mexico[1]
New York[8]
North Carolina[6]
North Dakota
Ohio
Oklahoma[1]
Oregon
Pennsylvania[8]
Rhode Island
South Carolina[8]
South Dakota[6]
Tennessee
Texas
Utah[6]
Vermont[6]
Virginia
Washington[7]
West Virginia
Wisconsin[6]
Wyoming[1]
Alaska[5]
Canal Zone
Guam
Hawaii
Puerto Rico
Virgin Islands[6]

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1. Not specified by law.
2. Entrance requirement prescribed by accrediting agencies.
3. Three years for applicants matriculating after Jan. 1, 1954.
4. One year prior to 1919, two years subsequent to 1947 including courses in physics, chemistry, and biology.
5. Premedical training must include courses in physics, chemistry, biology, English, and a foreign language.
6. Three-year college requirement.
7. For all applicants courses in physics, chemistry, and biology must be included in premedical training.
8. *Premedical training must include courses in English, physics, chemistry, and biology.*

Professional Educational Requirements of Licensing Boards

Recently there has been a tendency to increase the length of the academic year in medicine. Currently, the minimum medical school academic year is of 32 weeks' duration, and the medical degree is conferred after four such years or 128 weeks of medical school study. The state examining boards were queried as to whether the medical practice act makes it possible to accept for licensure examination graduates of approved medical schools who have compressed the same 128 weeks of medical school study into less than four calendar years. Forty-seven of the 55 licensing boards replied to this question. Thirty answered in the affirmative and 17 in the negative.

TABLE 18.—*Medical Licensing Boards Requiring One-Year Internship*

Alabama
Arizona
California
Colorado
Delaware[1]
District of Columbia
Idaho
Illinois[1]
Iowa
Kansas
Kentucky
Louisiana[1]
Maine
Michigan[1]
Missouri[2]
Montana
Nevada
New Hampshire
New Jersey[3]
North Dakota
Oklahoma
Oregon
Pennsylvania[1,4]
Rhode Island[1]
South Carolina
South Dakota
Utah
Vermont[1]
Washington[1]
West Virginia
Wisconsin
Wyoming[1]
Alaska[4]
Canal Zone
Guam
Hawaii
Puerto Rico[1]
Virgin Islands[1]

---

1. Internship must be a rotating service.
2. *For reciprocity applicants.*
3. One year rotating service or two years of straight internship or two-year residency in a specialty.
4. Internship may be a straight service for applicants after seven years from date of graduation from medical school.

Along with this question, the licensing boards were asked, if the answer to the above question was in the negative, if it was possible to obtain an interpretation of the medical practice act that would allow the board to accept for licensure examination a graduate of an approved medical school who had 128 weeks of medical school study in less than four calendar years. Of the 17 boards that replied no to the first question, 7 indicated it would be possible to obtain an interpretation of the medical practice act to accept graduates who had compressed their medical education in less than four calendar years, 8 replied that it would not be possible, 1 board was doubtful, and 1 board made no reply to the second question.

TABLE 19.—*Licensure, Registration, or Other Requirements for Interns*

Licensure	Other Requirements
Indiana	Colorado[6]
Puerto Rico	Florida[1]
	Massachusetts[3]
	New Jersey[7]
	South Carolina[5]
	Texas[2]
	Virginia[4]
	West Virginia[4]

---

1. Must register every six months with State Board of Health, and may serve for a period of three years without licensure.
2. Must register with Board annually.
3. Limited registration granted.
4. Graduates of unapproved foreign medical schools must obtain permission from Board.
5. Temporary permit required.
6. May serve for an aggregate period not to exceed four years; required to register with licensing board annually.
7. May serve for two years without licensure.

Approval of Medical Schools

Seven licensing boards maintain their own list of approved medical schools in the United States. Twenty-six boards require applicants for licensure from approved medical schools in the United States or Canada to be graduates of medical schools approved by the Council on Medical Education and

Hospitals. Two boards require membership in the Association of American Medical Colleges. Twenty boards specify that schools must be approved by the Council and be in membership in the Association of American Medical Colleges. In sixteen instances the requirement is specified in the medical practice act, 37 boards reported that it is a formal regulation, and two indicated that it was an informal policy. In actuality, all approved medical schools are both approved by the Council and in membership in the Association of American Medical Colleges.

TABLE 20 –*Licensure, Registration, or Other Requirements for Residents*

Licensure or Temporary Registration Required
Arkansas
California[1]
Connecticut[2]
Idaho
Illinois[3]
Indiana
Iowa[11]
Maine[4]
Massachusetts[5]
Michigan[14]
Minnesota[6]
Nevada[4]
New York[7]
North Carolina[6]
Oklahoma[4]
Pennsylvania[8]
South Carolina[14]
South Dakota
Texas
Wisconsin
Puerto Rico

Other Requirements
Colorado[9]
Delaware[15]
District of Columbia[15]
Florida[10]
Mississippi[1]
New Jersey[13]
Virginia[12]
West Virginia[12]

---

[1] May serve one year without licensure

[2] May be required by hospitals

[3] Applicants who wish to serve residencies in Illinois hospitals and who are not eligible for permanent registration may apply for temporary certificates which are issued without examination

[4] Temporary license for one year

[5] Limited registration granted

[6] Limited license for duration of residency

[7] Temporary certificate for residents, except in state mental and municipal hospitals

[8] Postgraduate certificate issued for residency training if licensed in any state or territory of the United States or Canada or hold the certificate of the National Board of Medical Examiners

[9] May serve for an aggregate period not to exceed four years; required to register with licensing board annually

[10] Three years without licensure Must register every six months with board of health

[11] Resident physician's licenses are issued for a period of not more than seven years for service in a hospital approved by the board

[12] Graduates of unapproved foreign medical schools must obtain permission from board

[13] May serve two years without licensure

[14] Temporary license for residency and postgraduate training

[15] Registration with licensing board required

Internship as a Prerequisite for Licensure

There is currently no medical school in the United States which requires that the student serve an internship as a prerequisite to graduation. Duke University School of Medicine specifies the internship requirement but does not withhold the degree until the internship is completed The degree is issued at the end of the four-year medical course, but the school obtains from each student a signed agreement that he will spend two years in training in a hospital or laboratory before entering practice.

One year of internship, as a requirement for licensure, is required by the licensing boards of 31 states, the District of Columbia, Alaska, the Canal Zone, Guam, Hawaii, Puerto Rico, and the Virgin Islands. Kansas, Louisiana, Missouri (for reciprocity applicants), Montana, and Guam reported the institution of this requirement in the past year.

TABLE 21.–*Temporary and Educational Permits, Limited and Temporary Licenses, or Other Certificates Issued by State Licensing Boards*

Arizona	Temporary permits issued on basis of community emergency and subject to qualifying for regular license A regular license limited to full time practice in federal and state hospitals or institutions or governmental public health departments
Arkansas	Temporary permits are granted reciprocity applicants until regular board meeting
Delaware	Temporary emergency license upon proved emergency, one year, subject to renewal, and for locum tenens practice
Georgia	Permit until board meets Permits for practice in state institutions and for medical school faculty members
Idaho	To candidates holding certificate of National Board of Medical Examiners or licensed by written examination in another state until next meeting of board
Illinois	Temporary certificates for residency training for applicants who are not qualified for permanent registration Permit issued for service in state hospitals to physicians eligible for licensure
Indiana	Temporary license pending next examination for graduates of approved medical schools Temporary reciprocal license for six months
Iowa	Resident physicians licenses are issued for a period of not more than seven years for service in a hospital approved by the board
Kansas	Temporary permit until next board meeting
Kentucky	Temporary permits issued to applicants by endorsement and serve until investigations completed and meeting of board Limited licenses are for special place, purpose, and time
Louisiana	Temporary permit is granted to physicians possessing the necessary credentials who file application for examination or reciprocity and who locate in Louisiana between the regular semiannual examination meetings of the board Temporary permit valid until next meeting of the board
Maine	Temporary licenses granted for residency training for one year Must be an American citizen and a graduate of an approved medical school
Massachusetts	Limited registration covering appointment as intern, resident, or fellow in a specific hospital
Michigan	Temporary license for residency and postgraduate training program
Minnesota	Temporary certificate for postgraduate work in hospitals
Mississippi	Temporary permit for practice until next board meeting
Nevada	Temporary permit for one year for residency training
New Hampshire	Temporary license for five years to foreign physicians Permanent license issued upon becoming citizen of the United States
New Jersey	Temporary license for noncitizens Permanent license in six years; may be extended in additional two years
New Mexico	Limited for service in a state institution or in a hospital maintained by industry for the exclusive use of its employees
New York	Temporary certificate for residency training except in state, mental, and municipal hospitals
North Carolina	Limited license issued for duration of residency
North Dakota	Temporary permit for United States and Canadian graduates until next board examination
Oklahoma	Temporary licenses for residency training in approved hospitals
Pennsylvania	Postgraduate certificate issued for residency training if licensed in any state or territory of the United States or Canada or hold the certificate of the National Board of Medical Examiners
Rhode Island	Temporary permit for service in state institutions under supervision
South Carolina	Temporary permits for interns and residents
South Dakota	Temporary license issued for graduates of foreign medical schools for four years for practice in emergency medical areas
Texas	Temporary permit issued until next board meeting
Virginia	Temporary permit issued until next board meeting
West Virginia	Temporary permit issued until next board meeting to qualified applicants
Wisconsin	Temporary educational permit for graduates of foreign medical schools not recognized by board for licensure
Alaska	Temporary permits issued while processing permanent licensure, to summer cannery physicians, and to physicians in the armed forces on short periods with private physicians and for locum tenens work
Guam	Restrictive certificate to permit medical employees of federal contractors to practice in the discharge of their official duties
Puerto Rico	Special permit may be granted
Virgin Islands	Temporary certificates issued to military service personnel on duty and to municipal personnel until next license examination

Eleven boards specify that the internship must be a rotating service. New Jersey reported that a one-year general rotating internship or a two-year residency in a specialty will meet the board's requirement. While Pennsylvania requires a rotating internship, it will accept an internship completed on a straight service for applicants after seven years from date of graduation from medical school. Those licensing boards that require an internship for licensure are listed in table 18.

TABLE 22.—*Citizenship Requirements for Licensure*

No Requirement

California
District of Columbia
Indiana
Utah
Washington
Canal Zone
Guam
Virgin Islands

Declaration of Intention

Arizona
Connecticut
Illinois
Iowa
Maryland
Massachusetts
New Mexico
New York
Pennsylvania
Rhode Island
South Dakota
Texas
Virginia
Wisconsin
Hawaii

Full Citizenship

Alabama
Arkansas
Colorado
Delaware
Florida
Georgia
Idaho
Kansas
Kentucky
Louisiana
Maine
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
South Carolina
Tennessee
Vermont
West Virginia
Wyoming
Alaska
Puerto Rico

Licensure, Registration, or Other Requirements for Interns and Residents Serving in Hospitals

In the majority of states, physicians serving internships are not required to be licensed in the state in which the hospital where they are interning is located. Indiana and Peurto Rico have this requirement. The states which require some form of registration with the licensing board or a stipulation that the physician must be eligible for licensure are listed in table 19.

Twenty-nine boards require that physicians serving as residents in hospitals must be licensed or stipulate registration in the state. Seven boards indicate that registration must be in the form of a regular license. Other boards do not require full licensure of residents but issue certificates limited in nature, which may be called a limited license, a resident's license, temporary permit, or temporary license. In a few instances a residency may be served for a specified period without licensure. The regulations of each of the licensing boards that exact some requirement of those engaged in residency training are given in table 20.

Temporary and Educational Permits, Limited and Temporary Licenses, or Other Certificates Issued by State Licensing Boards

Thirty-six boards provide for the issuance of temporary and educational permits, limited and temporary licenses, or other certificates for the practice of medicine. The terms for the issuance of such certificates vary. This limited registration may apply to hospital training, to those ineligible for licensure who seek further educational training, or for regular practice until the next regular session of the licensing board. A list of these states and information on the length of validity of this special registration are shown in table 21.

Citizenship Requirements for Licensure

The requirements pertaining to United States citizenship exacted by the various medical licensing boards are tabulated in table 22. Eight boards have no requiremnt for citizenship, 15 boards require the applicant for licensure to have declared his intention of becoming a United States citizen, and 32 boards require the applicant for licensure to be a full citizen. Nevada, New Hampshire, and North Dakota reported that the requirement is waived for

TABLE 23.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examinations	Licenses by Reciprocity or Endorsement Issued
Alabama	Annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	June and November	June and November
California	Quarterly	Continuously
Colorado	Twice annually	Quarterly
Connecticut	March, July, and November	Continuously
Delaware	Semiannually	Semiannually
District of Columbia	Twice annually	Quarterly
Florida	Twice annually	No reciprocity
Georgia	June and October	June and October
Idaho	Twice annually	Twice annually
Illinois	Quarterly	Quarterly
Indiana	Annually, June	Approximately eight times annually
Iowa	Twice annually	Monthly
Kansas	Twice annually	Twice annually
Kentucky	Semiannually	Every two months
Louisiana	June and December	June and December
Maine	March, July, and November	March, July, and November
Maryland	Twice annually	Monthly
Massachusetts	January and July	Once a month, except August
Michigan	June and October	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	Annually in June	June and December
Missouri	Three times annually	Six times annually
Montana	Semiannually	Semiannually
Nebraska	Annually	Continuously
Nevada	Quarterly	Quarterly
New Hampshire	Twice annually	Twice annually
New Jersey	June and October	Monthly except August
New Mexico	Twice annually	Twice annually
New York	June and December	Continuously
North Carolina	Annually	Five times annually
North Dakota	January and July	January and July
Ohio	June and December	January, April, July, and October
Oklahoma	Annually	Quarterly
Oregon	January and July	Quarterly
Pennsylvania	January and July	Monthly, except February and August
Rhode Island	Quarterly	Four times annually
South Carolina	Twice annually	Three times annually
South Dakota	Twice annually	Continuously
Tennessee	Quarterly	Continuously
Texas	Twice annually	Quarterly
Utah	Once annually	February, June, August, and November
Vermont	Twice annually	Continuously
Virginia	Twice annually	Twice annually
Washington	Twice annually	Twice annually
West Virginia	January and July	Quarterly
Wisconsin	January and July	Quarterly
Wyoming	Three times annually	Three times annually
Alaska	On application	On application
Canal Zone	On application	On application
Guam	On application	Continuously
Hawaii	January and July	Continuously
Puerto Rico	Twice annually	Continuously
Virgin Islands	Twice annually	Twice annually

citizens of Canada, while Oklahoma requires full citizenship for candidates applying for licensure by examination.

Schedule of Written Examination Dates and Reciprocity Meetings

The schedule of dates for written examination and meetings or oral examination for the issuance of licenses by reciprocity or by endorsement of credentials is given in table 23. In most instances written examinations are scheduled twice annually and reciprocity meetings quarterly or as soon as the application for licensure can be processed. In those states requiring a basic science certificate for licensure, dates of the examination or reciprocity meetings are arranged to coincide closely with the examination and meeting dates of the boards of examiners in the basic sciences. A few states issue temporary permits enabling physicians to begin the practice of medicine until the board examination or meeting is held.

TABLE 24.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$ 50	$ 50
Arizona	25	100
Arkansas	50	100
California	25	100
Colorado	25	50
Connecticut	35	75[a]
Delaware	25	100
District of Columbia	25	50[b]
Florida	50	...
Georgia	20	50
Idaho	25	100
Illinois	75	200
Indiana	25	100
Iowa	25	50
Kansas	50	50
Kentucky	50	75
Louisiana	25	15
Maine	27	52
Maryland	35	50
Massachusetts	25	50
Michigan	50	100
Minnesota	25	100
Mississippi	10	50
Missouri	25	100
Montana	50	75
Nebraska	25	50
Nevada	100	200
New Hampshire	30	50
New Jersey	50	100
New Mexico	50	50
New York	40	40
North Carolina	50	100
North Dakota	50	50
Ohio	25	50
Oklahoma	25	100
Oregon	25	100
Pennsylvania	25	100
Rhode Island	*20*	*20*
South Carolina	25	100
South Dakota	20	50
Tennessee	35	50[c]
Texas	50	100
Utah	25	50
Vermont	20	50
Virginia	25	100
Washington	25	25
West Virginia	25	100
Wisconsin	50	100
Wyoming	50	50
Alaska	35	*110*
Canal Zone	10	5
Guam	50	50
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	...

a. Endorsement of certificate of National Board of Medical Examiners, $35.

b. Endorsement of certificate of National Board of Medical Examiners, $25.

c. Endorsement of certificate of National Board of Medical Examiners, $10.

Medical License Fees

The fee charged by the medical licensing boards for registration by examination and also by reciprocity or endorsement of credentials is given in table 24. The examination fee is somewhat uniform throughout the country, the majority of the boards charging a fee of $25. The fee for a license by reciprocity or endorsement of credentials varies from $20 to $200. Six boards reported an increase in the fee charged for the written examination and four boards an increase in the fee charged for a license without written examination. Three boards—Connecticut, the District of Columbia, and Tennessee—have a lower fee for those being certified on the basis of the certificate of the National Board of Medical Examiners than for candidates licensed by endorsement of state licenses.

Licensure on Government Credentials

In most of the states no provision is made in the medical practice act for the acceptance of government credentials as a basis for licensure without examination. Eleven state licensing boards have indicated that in their discretion they may accept such credentials under varying regulations, but mainly the recognition is accorded to officers who obtained their commissions after examination. These states are Alabama, California, Delaware, Illinois, Maine, North Dakota, Pennsylvania, Texas, Utah, Vermont, and Wisconsin.

Annual Registration

Thirty-six states, the District of Columbia, Alaska, Guam, Hawaii, and the Virgin Islands require physicians to register their licenses annually or biennially. In table 25 are listed the licensing boards that exact this requirement and the fee charged for such registration. Some of these states require such registration whether or not the physician resides in the state. The fee charged ranges from $1 to $10. Six states have a nonresident fee. In Florida physicians are required to register with the State Board of Health, while Illinois, Missouri, New York, North Carolina, and West Virginia require biennial registration. The requirement of annual registration was initiated in North Carolina in 1957, and biennial registration in Illinois was also made a requirement in 1957.

Licensure of Foreign-Trained Physicians

Since February, 1950, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges have published a list of foreign medical schools whose graduates they have recommended for consideration on the same basis as graduates of approved medical schools in the United States and Canada. This has always been offered as an advisory list for the use of State Licensing Boards, Hospitals, Specialty Boards, and other organizations in the United States concerned with the evaluation of medical schools. These same organizations have always been advised that the list was acknowledged to be a tentative one and that the position of the Councils, with respect to the foreign medical schools not listed, has been that they neither approve nor disapprove of them.

TABLE 25.—*States Requiring Annual Registration*

State	Fee	State	Fee
Arizona	$ 5.00	North Carolina	$ 5.00
Arkansas	a	North Dakota	5.00
California	1.00	Oklahoma	5.00
Colorado	b	Oregon	f
Connecticut	*2.00*	*Pennsylvania*	*1.00*
District of Columbia	4.00	Rhode Island	1.00
Florida	1.00c	South Dakota	2.00
Georgia	3.00	Tennessee	5.00
Idaho	10.00	Texas	5.00
Illinois	6.00	Utah	3.00
Indiana	d	Vermont	2.00
Iowa	3.00	Virginia	1.00
Kansas	5.00	Washington	7.00
Louisiana	10.00	West Virginia*	2.00
Minnesota*	3.00	Wisconsin	3.00
Missouri	5.00	Wyoming	2.50
Montana	5.00	Alaska	10.00
Nebraska	3.00	Guam	None
Nevada	10.00	Hawaii	5.00
New Mexico	e	Virgin Islands	50.00
New York*	6.00		

* *Biennial registration.*
a. Residents $ 2, nonresidents $ 4.
b. Residents $ 2, nonresidents $10.
c. Required by State Board of Health.
d. Residents $ 5, nonresidents $10.
e. Residents $ 2, nonresidents $ 5
f. Residents $15, nonresidents $ 5.

After more than two years of cooperative study by representatives of the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Federation for State Medical Boards of the United States, a method for evaluating the graduates of foreign medical schools wishing to come to the United States has been devised. These agencies have sponsored the organization of the Educational Council for Foreign Medical Graduates to implement this new program. The details of the program are described elsewhere in this issue by the Executive Director, Dr. Dean F. Smiley.

In February, 1958, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges acted to withdraw the current list of foreign medical schools. The withdrawal of this list is to become effective as of Jan. 1, 1960.

The current requirements for foreign-trained physicians seeking medical licensure in the United States and its territories and outlying possessions are given in table 26. Foreign-trained physicians are not eligible for licensure in 10 states, the Canal Zone, and Puerto Rico. Ten states have added the requirement that the applicant must present the qualifying certificate of the Educational Council for Foreign Medical Graduates or is referred to the Educational Council for a recommendation. The specific requirement is noted under "additional requirements" in the text beneath the table. Eighteen boards limit licensure to those who have graduated from schools in the approved listing. Other boards have found the list useful in the evaluation of credentials, while some boards maintain their own list of schools whose graduates are acceptable for licensure. Eight boards do not require citizenship, 15 require declaration of intention, and 32 boards require full citizenship. Thirty-one boards reported that the foreign-trained physician must serve an internship or obtain further medical training in the United States. In addition to the items tabulated in this table, many of the boards have specific requirements or varying exemptions. The factual data pertaining to these regulations are included in the text immediately below the table.

This chart was developed by the Council on Medical Education and Hospitals of the American Medical Association in an effort to assist the foreign-trained physician seeking licensure in the United States. While an attempt has been made to present the situation as it exists, the table is intended to give only a summary of existing requirements. Persons interested in licensure should supplement these data by communicating with the licensing boards. Medical licensure in the United States is a "state right" and is entirely under the jurisdiction of the governments of the individual states. The power to license physicians is exercised through the medical licensing board of each state. Official supplementary information concerning the acceptability of foreign credentials and subsequent changes in the regulations should be obtained directly from the licensing boards.

The Council also publishes a compendium of information concerning foreign medical schools and the status of foreign medical credentials in the United States that has been prepared as an aid to foreign-trained physicians. In addition to data pertaining to medical licensure, this booklet contains sections pertaining to graduate training in the medical specialties, undergraduate medical study in the United States, advanced standing in American medical schools, and medical study in foreign medical schools.

Table 27 records the number of graduates of foreign faculties of medicine examined for medical licensure by 37 states, Alaska, Hawaii, and Puerto Rico in 1957. The figures include both foreign-born

TABLE 26.—*Status of Requirements for Medical Licensure for Physicians Trained in Foreign Countries Other Than Canada**

	Written Examination Required	Admitted Also on Reciprocal Basis	Citizenship	Basic Science Certificate	Internship in United States	Recognition Limited to Graduates of Schools Accepted by A. M. A. and A.A.M.C.	Additional Requirements	Exemptions	Examination Fee, Dollars
Alabama	x	..	x	..	x	..	x	..	50
Arizona	x	..	D	x	x	..	E	..	25
Arkansas	Not accepted								
California	x	..	..	..	x	..	x	x	25
Colorado	x	..	x	x	x	x	x	..	25
Connecticut	x	..	D	x	..	..	..	..	35
Delaware	x	..	x	..	x	x	x	..	25
Dist of Columbia	x	x	..	x	x	..	E	..	25
Florida	x	..	x	x	x	..	E	..	50
Georgia	x	x	x	..	..	x	..	..	20
Idaho	Not accepted								
Illinois	x	..	D	..	x	..	x	..	25
Indiana	x	..	..	..	..	..	x	..	25
Iowa	x	..	D	x	x	x	x	..	25
Kansas	x	x	x	x	x	..	..	x	50
Kentucky	x	..	x	..	x	..	x	..	50
Louisiana	Not accepted								
Maine	x	..	x	..	x	..	..	..	27
Maryland	x	..	D	..	x	..	..	x	35
Massachusetts	x	..	D	..	..	..	x	..	25
Michigan	x	..	x	x	x	..	x	..	50
Minnesota	x	..	x	x	x	x	x	..	25
Mississippi	x	..	x	..	..	x	..	..	10
Missouri	x	..	x	..	x	..	E	..	25
Montana	Not accepted								
Nebraska	x	..	x	x	..	x	..	..	25
Nevada	Not accepted								
New Hampshire	x	x	x	..	x	..	..	x	30
New Jersey	x	x	x	..	x	..	x	x	50
New Mexico	x	..	D	x	..	x	..	..	50
New York	x	..	D	..	..	..	..	..	40
North Carolina	x	..	x	..	..	x	..	..	50
North Dakota	x	..	x	..	x	..	E	..	50
Ohio	x	..	x	..	..	..	..	x	25
Oklahoma	x	..	x	x	x	x	..	..	25
Oregon	Not accepted								
Pennsylvania	x	..	D	..	x	x	..	x	25
Rhode Island	x	x	D	x	x	..	x	x	20
South Carolina	Not accepted								
South Dakota	x	..	D	x	x	..	E	..	20
Tennessee	x	x	x	x	..	x	..	..	35
Texas	x	..	D	x	..	..	x	..	50
Utah	Not accepted								
Vermont	Not accepted								
Virginia	x	..	D	..	x	..	x	x	25
Washington	x	x	..	x	x	x	..	..	25
West Virginia	x	..	x	..	x	..	x	..	25
Wisconsin	x	x	D	x	x	x	x	..	50
Wyoming	Not accepted								
Alaska	x	x	x	x	x	x	..	..	35
Canal Zone	Not accepted								
Guam	x	x	..	..	x	x	..	..	50
Hawaii	x	..	D	..	x	x	..	x	50
Puerto Rico	Not accepted								
Virgin Islands	x	..	..	..	x	x	x	..	65

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

x Implies yes.

D—Declaration of intention to become citizen of United States

* Graduates of medical schools of Canada considered for licensure on the same basis as graduates of approved medical schools in the United States provided they comply with regulations pertaining to citizenship and internship

E—Candidate must pass examination of Educational Council for Foreign Medical Graduates, Inc

Additional Requirements

Alabama. Candidate is eligible if he is certified by the National Board of Medical Examiners and approved.

California. Two year internship in an approved hospital in the United States, one of said years being in California

Colorado. Credentials must be submitted in original form and accompanied by translation and will be directly verified or documents should bear evidence of being visaed by the U. S Consul in the country wherein the school of graduation is or was located

Delaware. Residence for one year required Completion of senior year in approved medical school in the United States

Illinois. Limited license for practice in hospitals maintained by the state

Indiana. Graduation from medical school approved by Indiana board, plus repetition of senior year in approved medical school in United States or two years' postgraduate work in approved hospital in the United States Postgraduate work must be obtained in states other than Indiana

Iowa. Requirements include (1) medical diploma, (2) three years of residency training approved by the board, and (3) recommendation of the Educational Council for Foreign Medical Graduates

Kentucky. Applicant required to complete at least five years' training in the United States in an institution approved by the board and to have successfully passed examination of National Board of Medical Examiners

Massachusetts. Must furnish documentary evidence that education is equivalent to that of graduates of United States Medical schools and shall be required to take examination of National Board of Medical Examiners who shall certify that the applicant has successfully passed said examination.

North Dakota. Certificate of Educational Council for Foreign Medical Graduates accepted for admission to board examination

Rhode Island. After Jan. 1, 1958, must present qualifying certificate from Educational Council for Foreign Medical Graduates

Wisconsin. If education not equivalent to that offered at University of Wisconsin are referred to Educational Council for Foreign Medical Graduates for approval and then to the dean of the medical school

Exemptions

Illinois. Graduates of European medical colleges or universities Jan 1, 1943, with the exception of certain approved colleges in the British Isles, Denmark, Holland, Norway, Sweden, and Switzerland, will not be accepted after July 1, 1954 However, graduates of such European medical colleges after Jan 1, 1943, may be considered providing they present diplomas of graduation from approved medical colleges in the United States after attendance in such colleges for at least one year, and, in addition, have served rotating internship of one year in an approved hospital in Illinois Graduates, not on the recommended list, who obtained the medical degree after Jan 1, 1940, are not eligible; must serve three years in hospitals in United States and submit recommendations from the hospitals

Kansas. Applicant must be licensed to practice in country of graduation Application must be filed one year in advance

Maryland. Graduates of recommended medical schools may be accepted after completion of one year of internship or residency in an approved hospital in the United States

New Hampshire. Diplomates of National Board of Medical Examiners eligible on reciprocity basis Temporary license valid until citizenship is completed may be given Considered on an individual basis

Michigan. Completion of senior year in approved medical school in the United States or Canada, or M S degree in any field allied with medicine from a graduate school affiliated with an approved medical school, or, in lieu of above, certificate of an oral comprehensive examination in the basic sciences and clinical medicine by a joint screening board of examiners, from the faculties of the medical schools of the University of Michigan and Wayne University.

Minnesota. Two-year internship required

New Jersey. Original certificate covering medical courses, diploma and license in foreign country with translation by Lawyers' and Merchants' Translation Bureau, 11 Broadway, New York City.

Rhode Island. Must pursue postgraduate study or serve additional one year internship or residency. After Jan 14, 1955, must serve approved rotating internship in Rhode Island Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located.

South Dakota. Applicant required to practice in an emergency area for four years under a temporary license and reappear before the board for permanent licensure After July 1, 1955, only those cleared through IRO will be eligible.

Vermont. Must be diplomate of National Board of Medical Examiners

Virginia. Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, or must have completed the course of study and passed examinations equivalent to those required for a diploma or license conferring such full right to practice

New Jersey. Internship completed in foreign countries after July 1 1934, not acceptable Acceptance limited to schools recognized by the board Considered on an individual basis After Jan 1, 1955, must have minimum of three years' training in a hospital approved by the board

Ohio. Graduates of schools of Continental Europe after 1913 are eligible if on accepted list If not licensed in a foreign country must have one year in hospital in the United States; if not on accepted list, two years of training in an approved hospital in the United States Considered on an individual basis

***Pennsylvania.** Medical schools in China and Japan not accepted*

Rhode Island. Matriculants in foreign medical faculties subsequent to Jan 1, 1949, not acceptable unless applicant was a legal resident of Rhode Island at the time of matriculation at a *foreign medical* school and obtained his preprofessional training in the United States or Canada

Texas. European graduates after 1939 limited to English speaking schools

Virginia. Two years of internship in approved hospital in the United States or Canada within the past five years prior to application or one year of study in an approved medical school in lieu of one year of the internship

Hawaii. Diplomates of National Board eligible on reciprocity basis

West Virginia. Applicant must be resident of the state for three years preceding application and recommended by local society

Wisconsin. 1953 Legislature established One Year Temporary Educational Permit, which authorizes graduates of unapproved foreign schools to obtain residency training in approved hospitals May be renewed for two additional years

Virgin Islands. Residence of six months required

TABLE 27.—FOREIGN-TRAINED PHYSICIANS EXAMINED FO

Marginal Number	SCHOOL	1 Alabama		2 Arizona		3 California		4 Colorado		5 Connecticut		6 Delaware		7 District of Columbia		8 Florida		9 Georgia		10 Idaho		11 Illinois		12 Indiana		13 Iowa		14 Kansas		15 Maine	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ENGLAND—continued																														
62	University of Liverpool Medical School																														
63	University of London Faculty of Medicine					2	0			2	2											1	0			1	0				
64	University of Manchester Faculty of Medicine																														
65	University of Oxford School of Medicine									1	0																				
66	University of Sheffield Faculty of Medicine																														
67	Licentiate of the Royal College of Physicians London, Member of the Royal College of Surgeons England									1	0					1	0														
	ESTONIA																														
68	Tartu Ulikooli, Faculte de Medecine																					0	1								
	FINLAND																														
69	Helsingfors Universitet Medicinska Fakultedten, Helsingfors																														
70	Faculty of Medicine, Turku University, Turku																														
	FORMOSA																														
71	National Defense Medical College																														
	FRANCE																														
72	Universite de Lyon Faculte de Medecine et de Pharmacie					1	0															0	1								
73	Universite de Montpelier Faculte de Medecine																														
74	Universite de Paris Faculte de Medecine					1	1			3	0																			1	0
75	Universite de Toulouse Faculte de Medecine et de Pharmacie																					0	1								
76	Universite de Strasbourg Faculte de Medecine									0	1																				
77	Universite de Nancy Faculte de Medecine																														
	GERMANY																														
78	Friedrich-Wilhelms Universitat Medizinische Fakultat, Berlin									3	0											2	2								
79	Rheinische Friedrich-Wilhelms Universitat Medizinische Fakultat, Bonn																					0	1								
80	Schlesische Friedrich-Wilhelms Universitat Medizinische Fakultat, Breslau																					0	1								
81	Friedrich-[illegible] Erlangen					0	1			0	1					1	0					0	6							2	0
82	Albert-Lu[illegible] [illegible]elburg					3	0																								
83	Georg Au[illegible] [illegible]tingen					2	0															2	3								
84	Ernst-Moritz-Arndt Uni. Medizinische Fakultat, Greifswald																					0	1								
85	Universitat Heidelberg Medizini[illegible]			1	0	3	1															2	5							3	0
86	Christian-Albrechts Universitat [illegible]																					4	3								
87	Albertus Universitat Medizinisc[illegible]																														
88	Universitat Leipzig Medizinische Fakultat																														
89	Philipps Universitat Medizinische Fakultat, Marburg			1	0	2	0					1	0									2	2								
90	Ludwig-Maximilians Universitat Medizinische Fakultat, Munich			1	0	4	0			2	0	1	0			1	0					4	7							0	2
91	Universitat Rostock Medizinische Fakultat																														
92	Eberhard-Karls Universitat Medizinische Fakultat, Tubingen					1	0															3	4			1	0				
93	Julius-Maximilians Universitat Medizinische Fakultat, Wurzburg									1	0											1	2								
94	Hamburgische Universitat Medizinische Fakultat, Hamburg					3	0															1	2							1	0
95	Universitat Koln Medizinische Fakultat, Koln																					1	1								
96	Johann Wolfgang Goethe Universitat Medizinische Fakultat, Frankfurt-am-Main					1	0															3	3								
97	Westfalische Wilhelms Uni. Medizinische Fakultat, Munster																					1	1								
98	Medizinische Akademie Dusseldorf					0	1															2	1								
99	Humboldt University Medical S[illegible]																					0	2								
100	Medizinische Fakultat der Joha[illegible]																														
101	Freien Universitat Medizinische [illegible]					1	0			0	1											1	1								
	GREECE																														
102	National University of Athens School of Medicine					1	4			3	1	1	0									2	15							2	1
103	Aristotle University of Salonika					1	0			1	0																				
	GUATEMALA																														
104	Uni. Nacional de Guatemala Facultad de Ciencias Medicas					0	1																								
	HAITI																														
105	Ecole Nationale de Medecine et de Pharmacie, Port-au-Prince																					0	2								
	HONDURAS																														
106	Universidad Central de [illegible] Facultad de Medicina, Cirurgia y [illegible]					2	2																								
	ICELAND																														
107	Haskolo Islands Laec Knadeildin, Reykjavik																					1	0								
	HUNGARY																														
108	[illegible] Kiralyi Pazmany Petrus Tudomanyegyetem Orvosi [illegible]					0	1															0	1							1	0
109	[illegible] Josef Tudomanyegyetem Orvostudomanyi Kara, Szeged					0	1															1	0								
110	Magyar-Kiralyi Erzsebet Tudomanyegyetem Orvostudomanyi, Pecs					0	2			0	2																				
111	Magyar-Kiralyi Tisza-Istvan Tudomanyegyetem Orvost Fakultasa, Debrecen																					1	0								
	INDIA																														
112	University of Calcutta Medical College																					0	1								
113	University of Punjab Medical College					2	0			2	1																				
114	University of Madras Medical College																														
115	University of Uthal Medical College, Cuttack									1	0																				
	IRAN																														
116	Madresseh Teb Medical School, Teheran					1	0			2	1											0	4								
117	American School Medical Department, Urmia									0	1																				
	IRAQ																														
118	Royal Iraq Medical College, Bagdad					1	0															1	1								
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15	

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18 Michigan P F	19 Minnesota P F	20 Mississippi P F	21 Missouri P F	22 Nebraska P F	23 New Hampshire P F	24 New Jersey P F	25 New Mexico P F	26 New York P F	27 North Carolina P F	28 North Dakota P F	29 Ohio P F	30 Pennsylvania P F	31 Rhode Island P F	32 South Dakota P F	33 Texas P F	34 Virginia P F	35 Washington P F	36 West Virginia P F	37 Wisconsin P F	38 Alaska, Hawaii, Puerto Rico P F	39 Totals	40 Examined—Passed	41 Examined—Failed	42 % Failed	43 Number of Boards Examined by	Marginal Number
								1 1													2	1	1	50.0	1	62
								10 1								3 1	2 0				25	21	4	16.0	7	63
												1 0				0 1					2	1	1	50.0	2	64
																1 0					2	2	0	0.0	2	65
								1 1													2	1	1	50.0	1	66
								2 2			1 0										8	6	2	25.0	5	67
				1 0				0 5													10	2	8	80.0	5	68
																			1 0		1	1	0	0.0	1	69
								1 0													1	1	0	0.0	1	70
								1 0													1	1	0	0.0	1	71
								1 1													4	2	2	50.0	3	72
								1 1			1 0					1 0					5	4	1	20.0	4	73
								7 4								1 0					19	13	6	31.6	6	74
																					1	0	1	100.0	1	75
								0 1			1 0										4	2	2	50.0	4	76
								0 1													1	0	1	100.0	1	77
						1 1		1 6										1 0	1 0		18	9	9	50.0	6	78
								0 1			1 0										3	1	2	66.7	3	79
																					1	0	1	100.0	1	80
								0 2			3 2		1 0			1 1					23	9	14	60.9	10	81
								1 0			2 0		1 0			0 1					9	8	1	11.1	6	82
2 0								1 0			3 2		1 0			1 0					19	13	6	31.6	8	83
																					1	0	1	100.0	1	84
1 0	1 0							1 2			3 1					5 1					37	24	13	35.1	10	85
1 0	2 0													1 0							11	8	3	27.3	4	86
											0 1										1	0	1	100.0	1	87
								1 2													4	2	2	50.0	2	88
						1 0					1 0		1 0								11	9	2	18.2	7	89
3 0	2 0					1 0		5 2			9 6				3 0	6 2				1 0	72	46	26	36.1	17	90
								0 1													2	0	2	100.0	2	91
								0 2			1 2					1 1					17	7	10	58.8	7	92
											1 0		1 0			3 2					13	9	4	30.8	6	93
1 0								0 1						1 0	1 0	3 1					16	12	4	25.0	9	94
											0 1										3	1	2	66.7	2	95
1 0								1 2			1 1					1 1					18	10	8	44.4	7	96
								0 1			0 2			2 0							7	3	4	57.1	4	97
								0 1													5	2	3	60.0	3	98
																0 1					3	0	3	100.0	2	99
1 0																1 0					3	3	0	0.0	3	100
																					5	3	2	40.0	4	101
2 0						1 0		1 5			1 1					1 2					50	17	33	66.0	12	102
	1 0															2 0					7	7	0	0.0	5	103
																					1	0	1	0.0	1	104
											0 1					1 0				1 0	6	3	3	50.0	5	105
																					4	2	2	50.0	1	106
																					1	1	0	0.0	1	107
1 0						0 1		4 14			2 4	1 0		2 0		1 0					38	15	23	60.5	12	108
						0 1		0 1			0 1										6	2	4	66.7	6	109
						1 0		0 2						1 0							8	2	6	75.0	5	110
						1 0		0 3			1 1			1 0		2 0					10	6	4	40.0	6	111
																1 0					3	2	1	33.3	3	112
																					5	4	1	20.0	2	113
																					1	1	0	0.0	1	114
																					1	1	0	0.0	1	115
1 0								3 3			0 1					2 1					28	15	13	46.4	9	116
																					1	0	1	100.0	1	117
	1 0																				7	5	2	28.6	4	118
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	

TABLE 27.—FOREIGN-TRAINED PHYSICIANS EXAMINED FOR

Marginal Number		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Marginal Number		Alabama		Arizona		California		Colorado		Connecticut		Delaware		District of Columbia		Florida		Georgia		Idaho		Illinois		Indiana		Iowa		Kansas		Maine		Maryland	
	SCHOOL	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	IRELAND																																
119	Queen's University Faculty of Medicine, Belfast					2	0			5	0											2	0									1	
120	National University of Ireland Medical College					5	0			17	5			1	0							6	1									2	1
121	University of Dublin School of Physic									1	0					1	0					2	1										
122	Licentiate of the Royal College of Physicians of Ireland																																
123	Licentiate of the Royal College of Physicians, Licentiate of the Royal College of Surgeons of Ireland																													1	0	1	
	ISRAEL																																
124	Hadassah Medical School, Hebrew University, Jerusalem																															1	
	ITALY																																
125	Universita di Bologna Facolta di Medicina e Chirurgia					0	1			3	1											1	3							1	3	1	
126	Universita di Milano Facolta di Medicina e Chirurgia					1	0															2	0							1	0	3	
127	Universita di Firenze Facolta di Medicina e Chirurgia					1	0															0	1									0	1
128	Universita di Catania Facolta di Medicina e Chirurgia					0	1																							0	3		
129	Universita di Genova Facolta di Medicina e Chirurgia																					0	1									0	1
130	Universita di Messina Facolta di Medicina e Chirurgia																															0	
131	Universita di Modena Facolta di Medicina e Chirurgia									0	1																						
132	Universita di Napoli Facolta di Medicina e Chirurgia									1	0											0	2										
133	Universita di Padova Facolta di Medicina e Chirurgia															1	0					0	2							1	0		
134	Universita di Palermo Facolta di Medicina e Chirurgia																					1	3							1	0	0	1
135	Universita di Parma Facolta di Medicina e Chirurgia																					0	1					1	0				
136	Universita di Pavia Facolta di Medicina e Chirurgia																					0	1										
137	Universita di Perugia Facolta di Medicina e Chirurgia															1	0															0	1
138	Universita di Pisa Facolta di Medicina e Chirurgia																																
139	Universita di Roma Facolta di Medicina e Chirurgia									0	1											1	6							2	1	3	
140	Universita di Siena Facolta di Medicina e Chirurgia																																
141	Universita di Bari Facolta di Medicina e Chirurgia									1	1											0	1										
142	Libera Universita de Camerino Facolta di Medicina e Chirurgia																																
143	Universita di Torino di Medicina e Chirurgia					2	0			1	0											1	1							1	0		
	JAPAN																																
144	Tokyo Imperial University Faculty of Medicine					0	1																										
145	Chiba University of Medicine					0	1																										
146	Tohoku Imperial University Medical Faculty, Sendai																															1	
147	Kyoto Medic[illegible]											0	1																				
148	Keio Gijuku [illegible]																																
149	Teikoku Women's Medical-Pharmacological College, Tokyo					0	1											1	0														
	KOREA																																
150	Severance Union Medical College, Seoul																															1	1
151	College of Medicine, Seoul National University, Seoul					1	0																										
152	Seoul Women's Medical College					0	1																										
	LATVIA																																
153	Latvijas Universitate Medicinas Fakultate, Riga					1	0															0	1							2	0	0	
	LEBANON																																
154	American University of Beirut School of Medicine					2	0			1	0					1	0			1	0	2	2									3	
155	Faculte Francaise de Medecine de l'Universite de St. Joseph, Beyrouth									0	1																			1	0	1	
	LITHUANIA																																
156	University of Kaunas Medical Faculty					1	0															3	7									0	
	MANCHURIA																																
157	Mukden Medical College					1	0																									1	
	MEXICO																																
158	Universidad Nacional Autonoma de Mexico Facultad de Medicina, Mexico City					4	5			1	1											6	16			1	0					3	
159	Escuela de Medicina de Nuevo Leon, Monterrey																					1	2										
160	Universidad de Guadalajara Facultad de Ciencias Medicas y Biologicas			1	1	1	1															0	2										
161	Escuela Medico Militar, Mexico City																																
162	Facultad de la Universidad Nacional del sureste, Facultad Medicina, Merida, Yucatan																					0	1										
163	Escuela Nacional de Medicina Homeopatico, Mexico City																																
	NETHERLANDS																																
164	Universiteit van Amsterdam Geneeskunde Faculteit					1	1			1	1					1	1					4	1	1	0							2	
165	Rijks Universiteit te Groningen Medische Faculteit					0	1																										
166	Rijks Universiteit te Leiden Faculteit der Geneeskunde									2	0			1	0	1	0					0	3	1	0	2	0					2	
167	Rijks Universiteit te Utrecht Faculteit der Geneeskunde															1	0					2	0									1	
	NICARAGUA																																
168	Universidad de Nicaragua Facultades de Medicina en Leon y en Granada					0	2																										
	NORWAY																																
169	Kongelige Frederiks Universitet Medisinske Fakultet, Oslo																																
	PERU																																
170	Universidad Mayor de San Marcos de Lima Facultad de Medicina									1	1											2	4					0	1			1	
	PHILIPPINES																																
171	University of Santo Tomas Faculty of Medicine and Surgery					0	5															3	3									1	
172	University of the Philippines College of Medicine, Manila					1	0									1	0					0	1									1	
173	Centro Medical College, Manila																																
174	Manila Central University College of Medicine, Manila					1	1																										
Marginal Number		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	

MEDICAL LICENSURE IN THE UNITED STATES, 1957

17 Massachusetts		18 Michigan		19 Minnesota		20 Mississippi		21 Missouri		22 Nebraska		23 New Hampshire		24 New Jersey		25 New Mexico		26 New York		27 North Carolina		28 North Dakota		29 Ohio		30 Pennsylvania		31 Rhode Island		32 South Dakota		33 Texas		34 Virginia		35 Washington		36 West Virginia		37 Wisconsin		38 Alaska, Hawaii, Puerto Rico		39 Totals	40 Examined—Passed	41 Examined—Failed	42 % Failed	43 Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	13	11	2	15.4	6	119
3	4	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	35	12	25.5	8	120
1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	6	1	14.3	5	121
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	122
1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	3	0	0.0	3	123
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	124
0	1	..	..	2	0	..	..	0	2	..	..	..	..	19	1	..	..	16	20	..	..	..	..	2	2	..	..	4	1	..	..	..	..	8	0	..	..	1	0	..	..	..	..	90	53	37	41.1	14	125
0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	15	12	3	20.0	9	126
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	6	1	5	83.3	5	127
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	1	4	80.0	3	128
1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	3	3	50.0	5	129
..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	2	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	3	5	62.5	4	130
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	2	131
1	0	..	..	..	..	..	..	..	..	..	..	..	..	4	0	..	..	5	10	..	..	..	..	0	1	..	..	5	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	30	17	13	43.3	8	132
0	1	..	..	..	..	1	0	..	..	..	..	..	..	3	0	..	..	3	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	10	4	28.6	8	133
..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	17	8	9	52.9	6	134
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	2	1	33.3	3	135
..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	3	136
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	2	50.0	3	137
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	1	138
..	..	1	0	..	..	..	..	..	..	..	..	..	..	20	1	..	..	13	25	..	..	..	..	5	2	..	..	2	0	..	..	..	..	1	8	..	..	1	0	..	..	..	..	90	49	41	45.6	11	139
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	140
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	2	6	75.0	3	141
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	1	142
..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	2	4	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	10	5	33.3	7	143
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	144
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	145
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	146
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	147
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	148
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	149
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	2	1	33.3	2	150
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	151
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	152
..	..	2	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	4	11	..	..	1	1	0	5	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	33	13	20	60.6	10	153
2	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	..	..	..	..	..	..	1	0	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	27	20	7	25.9	12	154
0	2	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	5	4	44.4	7	155
..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	12	..	..	..	..	4	4	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	37	12	25	67.6	8	156
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	157
1	2	1	0	..	..	..	..	0	1	..	..	..	..	..	..	..	..	2	1	..	..	..	..	3	1	..	..	1	0	..	..	7	3	2	2	..	..	1	0	..	..	21	1	88	54	34	38.6	15	158
..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	9	2	1	1	..	..	..	..	..	..	..	..	18	13	5	27.8	5	159
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	2	4	66.7	3	160
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	161
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	2	1	33.3	3	162
..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	163
1	0	1	0	..	..	..	..	..	..	..	..	..	..	2	0	1	0	1	1	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	1	0	1	0	..	..	..	..	25	20	5	20.0	15	164
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	2	1	1	50.0	2	165
0	1	..	..	..	..	..	..	..	..	..	..	1	1	2	0	1	0	6	1	..	..	..	..	1	1	2	0	1	0	..	..	..	..	3	0	..	..	..	..	..	..	..	..	33	26	7	21.2	16	166
..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	1	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	11	10	1	9.1	9	167
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	4	1	3	75.0	3	168
0	1	..	..	1	0	..	..	..	..	..	..	0	1	..	..	..	..	1	0	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	5	169
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	14	8	6	42.8	5	170
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	2	0	..	..	..	..	..	..	1	2	25	12	13	52.0	6	171
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	9	6	3	33.3	6	172
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	1	0	1	100.0	1	173
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	2	1	33.3	2	174
17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39	40	41	42	43	

TABLE 27.—FOREIGN-TRAINED PHYSICIANS EXAMINED FOR

Marginal Number	SCHOOL	Alabama		Arizona		California		Colorado		Connecticut		Delaware		District of Columbia		Florida		Georgia		Idaho		Illinois		Indiana		Iowa		Kansas		Maine		Maryland	
Marginal Number		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	POLAND																																
175	Uniwersytet Jagiellonski Wydzial Lekarski, Cracow																					0	1										
176	Uniwersytet Jana Kazimierza Wydzial Lekarski, Lwow																					0	1										
177	Uniwersytet Jozefa Pilsudskiego, Warsaw																					1	2									0	1
178	Uniwersytet Poznanski Wydzial Lekarski, Poznan																					0	1									0	1
179	Uniwersytet Stefana Batorego Wydzial Lekarski, Wilno																					0	2										
	PORTUGAL																																
180	Universidade de Coimbra Faculdade de Medicina									2	1																					1	1
181	Universidade de Lisboa Faculdade de Medicina									0	1																						
	RUMANIA																																
182	Universitatea din Bucuresti Facultatea de Medicina																					1	0										
183	Universitatea din Iasi Facultatea de Medicina																					0	1										
184	Universitatea din Cluj Facultatea de Medicina																																
	SCOTLAND																																
185	University of Aberdeen Faculty of Medicine																																
186	University of St. Andrews Conjoint Medical School					0	1																										
187	University of Edinburgh Faculty of Medicine					1	0			1	1					1	0					1	0										
188	University of Glasgow Medical Faculty													1	0																		
189	St. Mungo's College Medical School, Glasgow																																
190	Licentiate of the Royal College of Physicians of Edinburgh, Licentiate of the Royal College of Surgeons of Edinburgh, Licentiate of the Royal Faculty of Physicians and Surgeons of Glasgow																	1	0														
191	Polish School of Medicine, Edinburgh																													1	0	1	0
	SOUTH AFRICA																																
192	University of Witwatersrand Medical School, Johannesburg																																
193	University of Cape Town Faculty of Medicine			1	0	2	0															1	0										
	SPAIN																																
194	Universidad de Barcelona Facultad de Medicina																															1	0
195	Universidad de Sevilla Facultad de Medicina									0	1																						
196	Universidad Central de Espana Facultad de Medicina, Madrid					1	0									0	1					0	1									1	0
197	Universidad de Santiago Facultad de Medicina																					0	1										
198	Universidad de Zaragoza Facultad de Medicina																					1	0									0	1
199	Universidad de Valencia Facultad de Medicina									1	0											3	0									1	1
200	Universidad de Salamanca Facultad de Medicina																					0	1									0	1
	SWEDEN																																
201	Kungl. Karolinska Universitetet Medicinska Fakulteten, Lund																																
202	Karolinska Mediko-Kirurgiska Institutet, Stockholm									1	0			1	0							1	0									1	0
	SWITZERLAND																																
203	Universitat Basel Medizinische Fakultat			1	0	1	0			1	0																					1	1
204	Universitat Bern Medizinische Fakultat					1	0			5	1											1	0									1	0
205	Universite de Geneve Faculte de Medecine					2	0	3	0	6	1			2	0	4	0	1	0			3	0	1	0					0	1	6	0
206	Universite de Lausanne Faculte de Medecine							1	0	4	0					1	0																
207	Universitat Zurich Medizinische Fakultat					1	0			1	0					1	1													1	0	1	0
	TURKEY																																
208	University of Istanbul Medical Faculty					2	0															2	2			1	0					6	5
209	Central Turkey College Medical Faculty																																
210	Ankara University Faculty of Medicine																															1	0
	UNION OF SOCIALIST SOVIET REPUBLICS																																
211	First Leningrad Medical Institute																																
212	Voronezh Medical Institute																																
213	Kazan Medical Institute																																
214	Kharkov Medical Institute																					0	2									0	1
215	Kiev Medical Institute					0	1															1	0										
216	First Moscow Medical Institute																					0	2										
217	Odessa Medical Institute																					0	1										
218	Tomsk Medical Institute																																
219	Dnepropetrovsk Medical Institute																															1	0
220	Second Moscow Medical Institute																																
221	Kuban Red Army Institute of Medicine, Krasnodar																																
222	Tbilisi Institute of Medicine, Georgia																					0	1										
223	Ashkhabad Institute of Medicine																																
224	Imperial New Russian University, Odessa																																
	WALES																																
225	Welsh National School of Medicine, Cardiff													1	0									1	0								
	YUGOSLAVIA																																
226	Zagrebaskog Universiteta Medecinski Fakultet																					1	2									1	1
227	Beogradskog Universiteta Medecinski Fakultet																					0	3										
	Totals	1		7		140		4		129		5		8		43		5		1		379		6		7		3		35		[illegible]	
	Totals Examined Passed	1		6		90		4		87		4		8		28		5		1		128		6		7		2		24		[illegible]	
	Totals Examined Failed	0		1		50		0		42		1		0		15		0		0		2,511		0		0		1		11		[illegible]	
	Percentage Failed	0.0		85.7		55.6		0.0		32.6		20.0		0.0		35.0		0.0		0.0		66.0		0.0		0.0		33.3		31.4		[illegible]	
Marginal Number		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	

MEDICAL LICENSURE IN THE UNITED STATES, 1957

17	18 Michigan P F	19 Minnesota P F	20 Mississippi P F	21 Missouri P F	22 Nebraska P F	23 New Hampshire P F	24 New Jersey P F	25 New Mexico P F	26 New York P F	27 North Carolina P F	28 North Dakota P F	29 Ohio P F	30 Pennsylvania P F	31 Rhode Island P F	32 South Dakota P F	33 Texas P F	34 Virginia P F	35 Washington P F	36 West Virginia P F	37 Wisconsin P F	38 Alaska, Hawaii, Puerto Rico P F	39 Totals	40 Examined—Passed	41 Examined—Failed	42 % Failed	43 Number of Boards Examined by	Marginal Number
									0 4													5	0	5	100.0	2	175
	1 0								2 6			0 1										11	3	8	72.7	4	176
							1 0		2 3				1 0									11	5	6	54.5	5	177
									2 2													6	2	4	66.7	3	178
									0 1			0 1										4	0	4	100.0	3	179
																					1 0	6	4	2	33.3	2	180
																						1	0	1	100.0	1	181
									0 4			1 0					1 0					7	3	4	57.1	4	182
									0 1													2	0	2	100.0	2	183
									1 0										1 0			2	2	0	0.0	2	184
									0 2								0 1					3	0	3	100.0	2	185
													1 0				1 0					3	2	1	33.3	3	186
									2 0								1 0					8	7	1	12.5	6	187
		2 0							5 1												1 0	10	9	1	10.0	4	188
							1 0															1	1	0	0.0	1	189
									1 0			0 1										3	2	1	33.3	3	190
									0 1													3	2	1	33.3	3	191
	1 0								1 0													2	2	0	0.0	2	192
0		1 0							1 1													9	8	1	11.1	6	193
0																	1 0				4 0	7	7	0	0.0	3	194
																	1 0					2	1	1	50.0	2	195
							1 0		2 1												24 1	33	29	4	12.1	6	196
																						1	0	1	100.0	1	197
																						2	1	1	50.0	2	198
																	1 1					8	6	2	25.0	4	199
																					1 0	3	1	2	66.7	2	200
																1 0						1	1	0	0.0	1	201
																	1 0					5	5	0	0.0	5	202
									5 2			1 0										13	10	3	23.1	6	203
	1 0						2 0		17 9			1 0	2 0						0 1			42	31	11	26.2	10	204
				1 0		0 1	5 0	0 2	14 13			3 0					1 1	1 0		1 0	2 0	75	56	19	25.3	20	205
1						1 0	4 0	1 0	15 14			2 0	1 0		1 0					2 0	1 0	49	34	15	30.6	13	206
	1 0			1 0		1 0			19 0			1 0	1 0					2 0		2 0		34	33	1	2.9	13	207
																						28	18	10	35.7	9	208
0									2 8		1 0	1 0					2 0					2	0	2	100.0	1	209
																	0 2					1	1	0	0.0	1	210
																						1	1	0	0.0	1	211
									0 1								1 0					1	0	1	100.0	1	212
									0 1													2	1	1	50.0	2	213
														1 0								7	1	6	85.1	3	214
									0 1			1 3										6	2	4	66.7	4	215
									0 2			1 2										4	0	4	100.0	2	216
	1 0								0 1													4	2	2	50.0	4	217
									1 0								1 0					1	1	0	0.0	1	218
																						1	1	0	0.0	1	219
																						1	1	0	0.0	1	220
												1 0										1	0	1	100.0	1	221
												0 1										1	0	1	100.0	1	222
							0 1															1	0	1	100.0	1	223
									1 0													1	1	0	0.0	1	224
									2 0													5	4	1	20.0	4	225
									1 2								0 1					11	4	7	63.6	4	226
									0 3			0 1										6	0	6	100 0	2	227
	30	17	2	12	1	8	93	5	591	3	3	159	15	37	13	43	137	9	8	7	80	2,299					
	30	17	2	9	1	5	86	3	268	1	2	86	15	36	13	34	91	9	7	7	72		1,345				
	0	0	0	3	0	3	7	2	323	2	1	73	0	1	0	9	46	0	1	0	8			954			
7	0.0	0.0	0.0	25.0	0.0	37.5	7.5	40.0	54.7	66 6	33.3	45.9	0.0	2.7	0.0	21.0	33.6	0.0	12.5	0 0	10.0				41.5		
	18	9	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	

TABLE 28.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1957*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	918	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
1950	799	359	55.0
1951	1,006	524	47.9
1952	1,208	648	46.3
1953	1,463	796	46.3
1954	1,642	943	42.6
1955	1,771	1,042	41.4
1956	1,783	1,012	43.2
1957	2,299	1,315	41.5
Totals	27,867	14,816	46.8

physicians and American citizens educated abroad. Graduates of medical schools in the Philippines, Iceland, 16 South and Central American countries, 28 countries of Europe, and 14 countries in Asia were represented at examinations. The number totaled 2,299. Graduates of 233 medical schools and 5 licensing corporations were examined. The number who were successful was 1,345; failures numbered 954, or 41.5%. More than 50 graduates each from the universities of Habana, Mexico City, Bologna, Rome, Munich, and Genève were tested in 1957, and more than 25 graduates each from 18 other schools were examined.

The greatest number examined by any one state was 591 in New York, of whom 268 passed, and 323, or 54.7%, failed. Illinois examined 379, of whom 128 passed, and 251, or 66%, failed. Maryland examined 200, of whom 126 passed, and 74 (37%) failed; 159 were tested in Ohio, 86 passed, and 73 failed (45.9%). More than 125 were also examined in California, Connecticut, and Virginia. Other states examined fewer than 100.

TABLE 29.—*Foreign-Trained Physicians Licensed by State Boards, 1952-1957*

	Examination							Reciprocity and Endorsement							Grand Totals
	1952	1953	1954	1955	1956	1957	Total	1952	1953	1954	1955	1956	1957	Total	
Alabama	2	1	2	1	1	1	8	1	0	0	0	0	1	2	10
Arizona	1	1	0	2	3	6	13	0	0	1	4	1	0	6	19
Arkansas	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
California	98	95	83	135	177	90	678	1	0	1	0	0	0	2	680
Colorado	1	1	1	3	0	4	10	0	0	0	0	0	0	0	10
Connecticut	7	21	13	13	48	87	189	4	9	19	23	16	19	90	279
Delaware	2	1	1	1	4	4	13	2	0	3	0	0	1	6	19
Dist. of Columbia	2	2	6	2	2	8	22	4	6	14	10	12	16	62	84
Florida	14	11	13	27	33	28	126	0	0	0	0	0	0	0	126
Georgia	2	6	6	2	5	5	26	1	2	3	3	6	2	17	43
Idaho	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Illinois	153	208	216	157	261	128	1,123	0	0	3	0	0	0	3	1,126
Indiana	0	0	20	2	6	6	34	2	0	16	4	9	21	52	86
Iowa	3	10	5	4	18	7	47	5	3	2	1	1	3	15	62
Kansas	1	0	1	3	5	2	12	0	0	0	0	0	0	0	12
Kentucky	0	0	0	0	0	0	0	0	0	1	0	1	0	2	2
Louisiana	0	1	3	1	0	0	5	0	0	0	0	0	0	0	5
Maine	4	13	16	44	43	24	144	3	2	7	6	4	5	27	171
Maryland	31	30	44	55	106	126	392	0	0	1	0	1	1	3	395
Massachusetts	10	10	7	11	27	24	89	1	1	4	2	4	0	12	101
Michigan	10	15	25	40	23	30	143	1	5	7	17	14	23	67	210
Minnesota	10	23	17	17	16	17	100	0	0	0	0	0	1	1	101
Mississippi	1	0	1	2	0	2	6	0	0	0	0	0	0	0	6
Missouri	5	3	4	14	20	9	55	0	0	1	0	2	0	3	58
Montana	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2
Nebraska	0	0	0	0	2	1	3	0	1	1	0	0	1	3	6
Nevada	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
New Hampshire	2	1	4	3	9	5	24	1	1	6	3	5	7	23	47
New Jersey	3	6	19	23	52	86	189	21	25	24	22	42	23	157	346
New Mexico	1	0	3	4	2	3	13	1	4	1	1	2	0	9	22
New York	171	172	184	159	467	268	1,421	31	15	8	7	5	1	67	1,488
North Carolina	4	11	8	0	2	1	26	1	2	1	2	1	1	8	34
North Dakota	6	1	0	5	9	2	23	0	0	0	0	0	0	0	23
Ohio	34	66	177	160	166	86	629	23	36	48	47	27	19	200	829
Oklahoma	0	0	0	0	0	0	0	0	1	1	1	0	0	3	3
Oregon	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
Pennsylvania	6	7	12	6	10	15	56	0	0	0	0	0	0	0	56
Rhode Island	23	26	34	35	47	36	201	1	0	1	1	2	4	9	210
South Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Dakota	5	1	2	4	1	13	26	0	0	0	0	1	3	4	30
Tennessee	1	0	1	0	2	0	4	0	1	0	0	3	0	4	8
Texas	6	18	14	16	28	34	116	0	0	0	3	4	1	8	124
Utah	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	0	0	0	0	0	0	0	0	0	2	3	2	2	9	9
Virginia	8	14	23	54	115	91	305	3	0	0	0	0	0	3	308
Washington	4	2	5	5	7	9	32	3	4	4	6	5	7	29	61
West Virginia	1	4	1	0	8	7	21	0	0	0	0	0	0	0	21
Wisconsin	3	1	3	2	2	7	18	1	0	3	1	8	13	26	44
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaska, Hawaii, and Puerto Rico	13	13	29	30	56	72	213	3	3	3	0	2	5	16	229
Totals	648	796	943	1,042	1,783	1,345	6,557	115	121	188	168	180	180	952	7,509

Table 28 presents the number of graduates of foreign faculties of medicine examined for medical licensure in the United States in 28 years (1930-1957). In 1936 the number of foreign-trained physicians seeking licensure in the United States began to increase, and by 1940 there were over three times as many as were tested in 1936. Beginning in 1944 the number examined began to decrease until 1951, when there was a noticeable increase. In each succeeding year the number examined has increased. In 1957, the increase over the previous year was 516. At no time in the 28-year period did fewer than 30% fail in a given year.

In table 29 figures are given for a five-year period (1952-1957), showing the number of foreign-trained physicians licensed by each state board, both after written examination and by endorsement of credentials. While table 28 reflects the candidates registered after examination only and indicates the percentage failing in each year, table 29 records the total licensed in each state. In the period shown there were 6,557 licenses issued to foreign-trained physicians after written examination and 952 by endorsement of credentials. The total number of such licentiates registered was 7,509.

Represented in table 30 are figures regarding the foreign-trained physicians registered in 1957 who were not previously licensed in the United States and who therefore are additions to the medical profession. There were 1,014 in this group, of whom 991 were licensed by written examination and 23 by endorsement of credentials. Comparative figures for seven previous years together with the figures for 1957 are given in table 31. In eight years (1950-1957) there were 5,557 foreign-trained physicians who were added to the physician population of the United States, 5,354 obtaining licensure by written examination and 203 by endorsement of credentials.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Twenty states, the District of Columbia, and Alaska have adopted by legislative action basic science requirements underlying the practice of the

CORRESPONDING OFFICERS OF BOARDS OF MEDICAL EXAMINERS IN THE UNITED STATES, TERRITORIES, AND OUTLYING POSSESSIONS

Alabama	Dr D G Gill, Secretry, State Office Building, Montgomery 4
Arizona	Mr Robert Carpenter, Executive Secretary, 826 Security Bldg , Phoenix
Arkansas	Dr Joe Verser, Secretary, Harrisburg
California	Dr Louis E Jones, Secretary, Room 536, 1020 N St , Sacramento
Colorado	Mrs Beulah H Hudgens, Executive Secretary, 1612 Tremont Pl , Denver 2
Connecticut	Dr Creighton Barker, Secretary, 160 St Ronan St , New Haven
Delaware	Dr Joseph S McDaniel, Secretary, Professional Building, Dover
District of Columbia	Mr Paul Foley, Deputy Director, 1740 Massachusetts Ave , N W , Washington
Florida	Dr Homer L Pearson, Secretary, 901 N W 17th St , Miami 36
Georgia	Mr Cecil L Clifton, 224 State Capitol, Atlanta 3
Idaho	Mr Armand L Bird, Executive Secretary, 364 Sonna Bldg , Boise
Illinois	Mr Fredric B Selcke, Superintendent of Registration, Capitol Building, Springfield
Indiana	Miss Ruth V Kirk, Executive Secretary, 538 K of P Bldg , Indianapolis
Iowa	Mr Ronald V Saf, Executive Secretary, State Office Building, Des Moines 19
Kansas	Dr F J Nash, New Brotherhood Building, Kansas City
Kentucky	Dr Russell E Teague, 620 South Third St , Louisville 2
Louisiana	Dr Edwin H Lawson, Secretary, 930 Hibernia Bank Bldg , New Orleans 12
Maine	Dr Adam P Leighton, Room 514, 142 High St , Portland
Maryland	Dr Frank K Morris, 1211 Cathedral St , Baltimore 1
Massachusetts	Dr Robert C Cochrane, Secretary, Room 37, State House, Boston 33
Michigan	Dr E C Swanson, Executive Secretary, 118 Stevens T Mason Bldg , West Michigan Ave , Lansing 8
Minnesota	Dr F H Magney, 230 Lowry Medical Arts Bldg , St Paul 2
Mississippi	Dr R N Whitfield, Assistant Secretary, Old Capitol, Jackson 113
Missouri	Mr John A Hailey, Executive Secretary, Box 4, State Capitol Building, Jefferson City
Montana	Dr Thomas L Hawkins, Secretary, 535 Fuller Ave , Helena
Nebraska	Mr Husted K Watson, Director, Room 1009, State Capitol Building, Lincoln 9
Nevada	Dr George H Ross, Secretary, 112 North Curry St , Carson City.
New Hampshire	Dr Mary M Atchison, Secretary, 107 State House, Concord
New Jersey	Dr Patrick H Corrigan, Secretary, 28 West State St , Trenton
New Mexico	Dr R C Derbyshire, Secretary, 227 East Palace Ave , Santa Fe
New York	Dr Stiles D Ezell, Secretary, 23 South Pearl St , Albany 7
North Carolina	Dr Joseph J Combs, Secretary, 716 Professional Bldg , Raleigh
North Dakota	Dr C J Glaspel, Secretary, Grafton.
Ohio	Dr H M Platter, Secretary, 21 West Broad St , Columbus 15
Oklahoma	Dr E F Lester, Secretary, 813 Braniff Bldg , Oklahoma City
Oregon	Mr Howard I Bobbitt, Executive Secretary, 609 Failing Bldg , Portland 4
Pennsylvania	Mrs Margaret G Steiner, Acting Secretary, Box 911, Harrisburg
Rhode Island	Mr Thomas B Casey, Administrator, 366 State Office Bldg , Providence
South Carolina	Dr Harold E Jervey, Secretary, 1329 Blanding St , Columbia
South Dakota	Mr John C Foster, Executive Secretary, 300 First National Bank Bldg , Sioux Falls
Tennessee	Dr H W Qualls, Secretary, 1635 Exchange Bldg , Memphis 3
Texas	Dr M H Crabb, Secretary, 1714 Medical Arts Bldg , Fort Worth 2
Utah	Mr Frank E Lees, Director, 324 State Capitol Bldg , Salt Lake City 1
Vermont	Dr F J Lawliss, Secretary, Richford
Virginia	Dr K D Graves, Secretary, 631 First St , S W , Roanoke Address correspondence to Board of Medical Examiners
Washington	Mr Thomas A Carter, Secretary, Capitol Building, Olympia
West Virginia	Dr Newman H Dyer, Secretary, State Office Bldg No 3, Charleston 5
Wisconsin	Dr Thomas W Tormey Jr , Secretary, 1140 State Office Bldg , 1 West Wilson St , Madison.
Wyoming	Dr Franklin D Yoder, Secretary, State Office Bldg , Cheyenne
Alaska	Dr W M Whitehead, Secretary, 172 South Franklin St , Juneau
Canal Zone	Dr Charles O. Bruce, Health Director, Balboa Heights
Guam	Dr S F Provencher, Acting Secretary, Marianas Islands, Agana
Hawaii	Dr I L Tilden, Secretary, 1020 Kapiolani St , Honolulu
Puerto Rico	Mr Joaquin Mercado Cruz, Secretary, Box 9136, Santurce
Virgin Islands	Dr Earle M Rice, Secretary, St Thomas

healing art. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before the board and demonstrate his knowledge of the basic sciences. These boards have no licensing powers. A certificate of proficiency in fundamental sciences is issued that is a prerequisite to eligibility to secure a license to practice medicine or other method of healing.

TABLE 30.—*Graduates of Foreign Medical Faculties Representing Additions to the Medical Profession, 1957*

	Examination	Reciprocity and Endorsement	Total
Alabama	1	0	1
Arizona	2	0	2
Arkansas	0	0	0
California	36	0	36
Colorado	0	0	0
Connecticut	57	1	58
Delaware	3	0	3
District of Columbia	6	4	10
Florida	15	0	15
Georgia	4	0	4
Idaho	1	0	1
Illinois	113	0	113
Indiana	6	9	15
Iowa	9	0	9
Kansas	1	0	1
Kentucky	0	0	0
Louisiana	0	0	0
Maine	21	0	21
Maryland	82	0	82
Massachusetts	17	0	17
Michigan	10	0	10
Minnesota	14	0	14
Mississippi	3	0	3
Missouri	4	0	4
Montana	0	0	0
Nebraska	1	0	1
Nevada	0	0	0
New Hampshire	3	2	5
New Jersey	86	0	86
New Mexico	3	0	3
New York	156	0	156
North Carolina	1	0	1
North Dakota	1	0	1
Ohio	81	1	82
Oklahoma	0	0	0
Oregon	0	0	0
Pennsylvania	9	0	9
Rhode Island	33	0	33
South Carolina	0	0	0
South Dakota	13	0	13
Tennessee	0	0	0
Texas	29	0	29
Utah	0	0	0
Vermont	0	1	1
Virginia	81	0	81
Washington	8	2	10
West Virginia	6	0	6
Wisconsin	5	0	5
Wyoming	0	0	0
Alaska	0	0	0
Canal Zone	0	1	1
Guam	0	2	2
Hawaii	0	0	0
Puerto Rico	70	0	70
Virgin Islands	0	0	0
Totals	991	23	1,014

The term healing art, as defined by law, includes any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, or injury, or unhealthy or abnormal physical or mental condition, and includes specifically but not by way of limitation the practice of medicine and surgery; the practice of osteopathy; and the practice of chiropractic, or other branches of healing.

The states comprising this group, together with the year of enactment of the basic science law are recorded on table 32. As of July 1, 1957, the practice acts governing medicine, osteopathy, and chiropractic in the state of Kansas were repealed, and a new "Healing Arts Act" replaced the three previous boards. The act provides for the appointment of a "Healing Arts Board" and a "Basic Science Board." The Basic Science Board's function is to provide certification of ability in the basic sciences as a prerequisite to licensure by the Healing Arts Board.

TABLE 31.—*Additions to the Medical Profession Representing Graduates of Foreign Medical Faculties 1950-1957*

Year	Examination	Reciprocity and Endorsement	Totals
1950	267	41	308
1951	425	25	450
1952	545	24	569
1953	662	23	685
1954	749	23	772
1955	881	26	907
1956	834	18	852
1957	991	23	1,014
Totals	5,354	203	5,557

TABLE 32.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nebraska	1927
Arizona	1936	Nevada	1951
Arkansas	1929	New Mexico	1941
Colorado	1937	Oklahoma	1937
Connecticut	1925	Oregon	1934
District of Columbia	1929	Rhode Island	1940
Florida	1939	South Dakota	1939
Iowa	1936	Tennessee	1943
Kansas	1957	Texas	1949
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925

The subjects in which examinations are conducted are shown in table 33. The subjects are specified by statute. The boards have no authority to add any subjects or to refrain from examining in any subject, although in some states provision is made for certification by reciprocity, endorsement, waiver, or exemption. In 1957, the Oregon Board added bacteriology as one of the subjects of the examination, while the new board in Kansas speci-

TABLE 33.—*Subjects Included in Basic Science Examinations*

	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	x	x	x	..	x	x	x	..
Arizona	x	x	x	..	x	x	x	..
Arkansas	x	x	x	..	x	x	x	..
Colorado	x	x	x	..	..	x	x	..
Connecticut	x	..	..	x	x	x	x	..
District of Columbia	x	x	x	..	..	x	x	..
Florida	x	x	x	..	..	x	x	..
Iowa	x	x	x	..	x	x	x	..
Kansas	x	x	x	..	..	x	x	..
Michigan	x	x	x	..	..	x	x	..
Minnesota	x	x	x	..	x	x	x	..
Nebraska	x	x	x	..	x	x	x	..
Nevada	x	x	x	..	..	x	x	..
New Mexico	x	x	x	..	..	x	x	..
Oklahoma	x	x	x	..	..	x	x	..
Oregon	x	x	x	..	x	x	x	..
Rhode Island	x	x	x	..	..	x	x	..
South Dakota	x	x	x	..	..	x	x	..
Tennessee	x	x	x	..	..	x	x	x
Texas	x	x	x	..	x	x	x	..
Washington	x	x	x	..	x	x	x	..
Wisconsin	x	..	..	x	..	x	x	..

fies that it will test an applicant in anatomy, bacteriology, chemistry, pathology, and physiology. The credentials acceptable for certification without examination are listed in table 34. The Kansas Board has established no formal reciprocal agreements but will issue a certificate of proficiency on an individual basis to those applicants who meet the requirements of the Kansas law.

The results of examinations given and the number of certificates issued on the basis of reciprocity, endorsement, waiver, or exemption during 1957 are presented in tables 35 and 36. A candidate, in applying for a basic science certificate, is not required by law to reveal his school of practice. No attempt has been made to differentiate the schools of the healing arts represented by the candidates examined or certified. Ten states either had no failures or did not report figures for failures. The percentage of candidates failing is given for those states that did submit these data.

There were 4,866 candidates examined by the 22 boards in operation in 1957, and certificates of pro-

TABLE 34.—*Reciprocity, Endorsement, Waiver, or Exemption Policies of Basic Science Boards*

Alaska	Physicians are accepted on reciprocity from those states with which the board of medical examiners has established reciprocal agreements.
Arizona	A reciprocal certificate issued on the basis of a basic science certificate that has been obtained by an examination before the issuing board and provided that at least four subjects were passed at one sitting unless the state in question examines in fewer than four of the six subjects required by the Arizona law. Reciprocity will be extended to those applicants who were licensed to practice in a state prior to the passage of the basic science law of that state.
Arkansas	Reciprocity on the basis of written examination taken before all states having basic science laws, except Florida and Iowa. The credential of the National Board of Medical Examiners is acceptable for reciprocal registration.
Colorado	Reciprocity as to examination with the following basic science boards: Alaska, Arizona, Arkansas, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Texas, and Washington. Reciprocity as to examination with the Iowa Basic Science Board is granted to those candidates having made original application to the board on or before June 1, 1949. Candidates making application after that date and holding a certificate must meet the minimum requirements, i. e., that the candidate pass an examination in the basic sciences given by the basic science board of Colorado and that he pass, at one sitting, at least four of the five subjects given, with subsequent passing of the fifth subject. With Connecticut and Wisconsin there is reciprocity as to examination in the subjects of anatomy, physiology, and pathology. Candidates from these states are required to pass the examinations in chemistry and bacteriology.
Connecticut	No reciprocity with other basic science boards. Certification by endorsement obtainable by diplomates of the National Board of Medical Examiners or to candidates holding a license obtained by examination in another state. The latter is acceptable only after three years' professional activity.
District of Columbia	Reciprocity has not been established. The basic science board may exempt an applicant. All applications are considered on an individual basis.
Florida	No reciprocity, waiver, or exemption policies.
Iowa	All applications considered on an individual basis. Will accept other examinations if equally comprehensive to the Iowa examination.
Kansas	No formal reciprocal agreements. On an individual basis, applications for endorsement are considered on the basis of grades received in the basic sciences in examinations given by state boards of medical examiners, basic science certificates from other states or grades received in part I of the examination of the National Board of Medical Examiners. The board may in its discretion waive examination when proof satisfactory to the board is presented that the applicant is of good moral character, has a high school education or equivalent, and has passed an examination in the basic sciences which, in the opinion of the board, meets the requirements of the Kansas law.
Michigan	Certificates issued by examination are accepted for registration by waiver from the basic science boards of Alaska, Arkansas, Colorado, District of Columbia, Iowa, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Texas, Washington, and Wisconsin. Applicants who present certificates from the Wisconsin Basic Science Board are examined in bacteriology and chemistry. Applicants who present certificates from the basic science boards of Oregon and Washington are examined in bacteriology. The Michigan Board may accept, in lieu of its own examination, the basic science portion of the examination given by any legally constituted examining or licensing board in the healing arts, if such examination is equal or equivalent to the examination given by the Michigan Board.
Minnesota	Reciprocity on an automatic basis with the basic science boards of Colorado, Nebraska, Oregon, and Tennessee (after Feb. 9, 1950), and on the basis of having passed part I of the examination of the National Board of Medical Examiners. Reciprocity on an individual basis with the basic science boards of Alaska, Arizona, Connecticut, Michigan (grades must be 75% or more in each subject), Nevada, New Mexico, Oklahoma, South Dakota, and Texas. Reciprocity on an individual basis with the medical licensing boards of California, Indiana, Kansas, Kentucky, New York (subsequent to 1925), Oklahoma, Texas, Vermont, Virginia, Washington (grades must be 75% or more in each subject), and West Virginia. Partial credit granted for grades in certain subjects passed in examinations of medical licensing boards of Alabama, Georgia, Louisiana, North Carolina, Washington, and Wisconsin.
Nebraska	No reciprocal agreements; consideration given on an individual basis. A grade of at least 75% is required in each subject, and application must be made in conjunction with an acceptable application for reciprocal licensure in one of the healing arts.
Nevada	Reciprocity on the basis of written examination with the basic science boards of Arizona, Colorado, Iowa, Minnesota, New Mexico, Oklahoma, Oregon, South Dakota, Tennessee, Texas, and Washington. Waiver with basic science boards of Arkansas, Florida, Michigan, Nebraska, and Wisconsin (partial waiver).
New Mexico	By waiver—for physicians who have been in continuous practice for at least 30 years. By reciprocity for applicants who hold certificates issued by virtue of a written examination from Arizona, Arkansas, Colorado, Michigan, Minnesota, Nevada, Oklahoma, Oregon, South Dakota, Tennessee, and a limited agreement with Iowa, Washington, and Wisconsin.
Oklahoma	Applicants are reviewed on an individual basis. If qualified, will be accepted provided other state extends a like privilege to those holding basic science certificates in Oklahoma. A basic science certificate is not a prerequisite for licensure by reciprocity but is a requirement for licensure by examination.
Oregon	Reciprocity on the basis of written examination with the basic science boards of Arizona, Colorado, Iowa, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, South Dakota, Tennessee, Texas, Washington, and Wisconsin. After March 1, 1958, candidates for reciprocity must present evidence of two years' study of liberal arts or science, if they have received their basic science certificate after that date. Applicants who received their basic science certificate prior to this date need only comply with the regulations for high school graduation.
Rhode Island	Endorsement after oral examination with Massachusetts Board of Registration in Medicine, and basic science boards of Colorado, District of Columbia and Oklahoma.
South Dakota	Reciprocity with the basic science boards of Alaska, Arizona, Arkansas, Colorado, Iowa, Kansas, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Tennessee, Texas, Washington, and Wisconsin.
Tennessee	Reciprocity with the basic science boards of Alaska, Arizona, Arkansas, Colorado, District of Columbia, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, South Dakota, Texas, and Washington.
Texas	Reciprocity with the basic science boards of Alaska, Arizona, Arkansas, Colorad [illegible] raska, Nevada, Oklahoma, [illegible] Washington, and partial [illegible] from Wisconsin required [illegible] teriology, chemistry, and public health, and hygiene.
Washington	The basic science examination given in Alaska, Arizona, Arkansas, Colorado, District of Columbia, Iowa, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Texas, and Wisconsin will be accepted if grade requirements are met. Not all of the above states examine in all of the subjects required by the Washington law. Missing subject or subjects must be completed by examination before the Washington Basic Science Board.
Wisconsin	Waiver to commissioned officers of the armed forces or the Public Health Service, to an applicant who has passed part I of the examination of the National Board of Medical Examiners, to a physician licensed to practice medicine in a state not having a basic science law or licensed in a state before the establishment of a basic science board provided he has served an internship or has practiced for at least one year since the license was granted, to a physician licensed in Canada, and to foreign trained physicians holding an M. D. degree from an acceptable school who are licensed to practice medicine in the country in which the school attended is located. Reciprocity on the basis of written examination with all states having basic science boards.

ficiency were issued to 4,024 individuals after written examination. In addition, as noted in table 36, 2,283 certificates were issued without examination by 17 boards. The number of applicants registered with or without written examination in 1957 was 6,307. Florida issued 871 such certificates, Michigan 776, Texas 674, Wisconsin 487, Arkansas 438, and Minnesota 429. Other states certified fewer than 400.

Table 37 records the number of candidates certified by basic science boards since 1927. This table indicates for each year the number of boards in operation in a given year, the number of candidates who passed and failed, the number registered without written examination, and the total certified. In this 31-year period, 91,000 certificates have been issued, 62,690 by examination and 28,310 by reciprocity, endorsement, exemption, or waiver. The percentage of failures in the examination was 19.4.

Table 35.—*Applicants Examined in Basic Sciences, 1957*

	Examined	Passed	Failed	% Failed
Alaska	23	21	2	8.7
Arizona	70	70	0*	0.0
Arkansas	618	382	236	38.1
Colorado	153	153	0*	0.0
Connecticut	128	128	0*	0.0
District of Columbia	19	16	3	15.8
Florida	871	871	0*	0.0
Iowa	174	174	0*	0.0
Kansas	38	26	12	31.5
Michigan	575	434	141	24.5
Minnesota	254	254	0*	0.0
Nebraska	205	155	50	24.4
Nevada	82	45	37	45.1
New Mexico	113	113	0*	0.0
Oklahoma	102	102	0*	0.0
Oregon	173	91	82	47.4
Rhode Island	176	148	28	15.9
South Dakota	45	33	12	26.7
Tennessee	169	169	0*	0.0
Texas	201	201	0*	0.0
Washington	205	167	38	18.5
Wisconsin	472	271	201	46.8
Totals	4,866	4,024	842	17.3

* Failure data not reported

Table 36.—*Basic Science Certificates Issued by Examination, Reciprocity, Endorsement, Exemption, or Waiver, 1957*

	Certified by		
	Examination	Reciprocity, Endorsement, Exemption, or Waiver	Total Certified
Alaska	21	24	45
Arizona	70	93	163
Arkansas	382	56	438
Colorado	153	103	256
Connecticut	128	265	393
District of Columbia	16	100	116
Florida	871	0	871
Iowa	174	68	242
Kansas	26	0	26
Michigan	434	342	776
Minnesota	254	175	429
Nebraska	155	22	177
Nevada	45	19	64
New Mexico	113	47	160
Oklahoma	102	0	102
Oregon	91	118	209
Rhode Island	148	0	148
South Dakota	33	26	59
Tennessee	169	136	305
Texas	201	473	674
Washington	167	0	167
Wisconsin	271	216	487
Totals	4,024	2,283	6,307

The registration or examination fee in the states requiring basic science certification is given in table 38. In seven instances a higher fee is exacted of those desiring certification without written examination. Examination and endorsement meetings are held in most instances semiannually or coincide with the examinations and meetings scheduled by the licensing boards. The Journal publishes semimonthly the future dates of examination and reciprocity meetings of all basic science boards.

Table 37.—*Candidates for Basic Science Certification, 1927-1957*

	No. of Boards	Examination			Reciprocity, Endorsement, Exemption, or Waiver	Total Certified
		Passed	Failed	% Failed		
1927	5	294	33	10.0	27	321
1928	5	617	88	12.4	19	636
1929	7	641	93	12.6	75	716
1930	7	636	127	16.6	122	758
1931	7	634	153	19.4	141	775
1932	7	634	101	13.7	118	752
1933	8	557	104	15.7	131	688
1934	9	751	115	13.3	138	889
1935	10	794	162	16.8	114	908
1936	10	917	181	16.4	243	1,160
1937	12	1,102	242	18.0	202	1,304
1938	12	1,096	230	17.3	293	1,389
1939	14	1,110	249	18.3	1,021	2,131
1940	16	1,293	290	18.3	346	1,639
1941	17	1,751	373	17.5	353	2,104
1942	17	1,725	497	22.3	304	2,029
1943	18	2,309	410	15.1	382	2,691
1944	18	2,144	605	22.0	309	2,453
1945	18	2,339	634	21.3	584	2,923
1946	19	2,558	692	21.2	1,474	4,032
1947	19	2,633	905	25.6	960	3,593
1948	19	3,038	789	20.6	1,418	4,456
1949	20	3,656	1,515	29.5	1,480	5,136
1950	20	3,430	1,340	28.1	2,526	5,956
1951	21	3,198	735	18.7	1,939	5,137
1952	21	3,806	1,346	26.1	1,924	4,730
1953	21	3,854	1,220	24.0	1,899	5,753
1954	21	3,941	874	18.2	1,976	5,917
1955	21	3,474	447	11.1	1,936	5,410
1956	21	3,734	741	16.6	2,373	6,107
1957	22	4,024	842	17.3	2,283	6,307
Totals		62,690	15,133	19.4	28,310	91,000

Table 38.—*Basic Science Registration Fees*

Alaska	$25	Nebraska	$10[3]
Arizona	20	Nevada	25
Arkansas	20[5]	New Mexico	50
Colorado	25	Oklahoma	15[2]
Connecticut	25	Oregon	25
District of Columbia	25	Rhode Island	10
Florida	10	South Dakota	25
Iowa	10	Tennessee	25
Kansas	10[1]	Texas	15[4]
Michigan	10	Washington	10[4]
Minnesota	25[2]	Wisconsin	10[3]

Fee for registration without examination: (1) $5; (2) $50; (3) $15; (4) $25. (5) First certification no fee; all subsequent examinations $10.

In 1957, there were 4,866 examinations given by basic science boards; 4,024 were successful, and 842 examination results were reported as unsuccessful. Unless permitted reexamination, the latter group does not qualify for consideration for licensure in the healing art in which they are interested. The several basic science boards differ widely from each other in the restrictions put upon the candidate with respect to repetition of examinations that have been failed and the accumulation of credit. Because of these differences, the data in this section are presented in factual form as reported, and no attempt has been made to analyze the data on a comparable basis from state to state.

While the informative data presented may be useful to those seeking licensure in these states, it is recommended that the information be supplemented by direct communication with the basic science board. The present executive corresponding officer of each of the 22 basic science boards is as follows:

Arizona	Mr. Herman E. Bateman, University of Arizona, Tucson.
Arkansas	Mr. S. C. Dellinger, Zoology Department, University of Arkansas, Fayetteville.
Colorado	Dr. Esther B. Starks, 1459 Ogden St., Denver 18.
Connecticut	Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.
District of Columbia	Mr. Paul Foley, 1740 Massachusetts Ave., N. W., Washington 6.
Florida	Mr. M. W. Emmel, Box 340, Gainesville.
Iowa	Mr. Elmer W. Hertel, Wartburg College, Waverly.
Kansas	Dr. Robert E. Stowell, University of Kansas School of Medicine, Kansas City.
Michigan	Mrs. Anne Baker, 116 Stevens T. Mason Bldg., W. Michigan Ave., Lansing 15.
Minnesota	Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.
Nebraska	Mr. Husted K Watson, Room 1009, State Capitol Bldg., Lincoln 9.
Nevada	Dr. Donald G. Cooney, Box 9005, University Station, Reno.
New Mexico	Mrs. Marguerite Cantrell, Box 1522, Santa Fe.
Oklahoma	Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.
Oregon	Dr. Earl M. Pallett, State Board of Higher Education, Box 5175, Portland.
Rhode Island	Mr. Thomas B. Casey, 366 State Office Bldg., Providence.
South Dakota	Dr. Gregg M. Evans, 310 E. 15th St., Yankton.
Tennessee	Dr. O. W. Hyman, 62 S. Dunlap St., Memphis.
Texas	Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.
Washington	Mr. Thomas A. Carter, Department of Licenses, Capitol Bldg., Olympia.
Wisconsin	Mr. William H. Barber, 621 Ransom St., Ripon.
Alaska	Dr. R. Harrison Leer, Box 204, Alaska Office Bldg., Juneau.

NATIONAL BOARD OF MEDICAL EXAMINERS

The National Board of Medical Examiners, founded in 1915, includes in its membership representation from the Federation of State Medical Boards of the United States, the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, the Armed Services, and the Veterans Administration. Members at large are elected from among leaders in medicine throughout the United States. The purpose of this examining agency is to administer an examination that may be accepted as an adequate qualification for a medical license. The National Board is not a national licensing board. It is the function of the individual states to determine who shall practice within their borders and to maintain high standards of medical practice in accordance with their own rules and regulations.

The certificate of the National Board of Medical Examiners is accepted as an adequate qualification by the medical licensing authorities of the states, the District of Columbia, and the territories with the following exceptions: Arkansas, Florida, Georgia, Indiana, Louisiana, Michigan, North Carolina, and Texas. The Georgia licensing board will accept certificates issued prior to October, 1953. The Michigan licensing board will accept applicants who have completed parts 1 and 2 prior to Nov. 1, 1954, but who require a special written supplemental examination. Supplemental oral examinations are required by the licensing boards of Illinois, Rhode Island, and Wyoming.

The following boards of examiners of the basic sciences accept the examinations of the National Board in lieu of their own: Alaska, Arkansas, Connecticut, Iowa, Kansas, Minnesota, Nebraska, Oklahoma, Tennessee, Wisconsin, and the District of Columbia. Diplomates of the National Board are required to take an examination in the basic sciences before obtaining a medical license in Arizona, Colorado, Florida, Michigan, Nevada, New Mexico, Oregon, Rhode Island, South Dakota, Texas, and Washington.

The examination is divided into three separate parts and may be taken during the course of training in the medical school. Parts 1 and 2 are of the multiple choice type. Each of the six examinations of part 1 and each of the five examinations of part 2 is developed by a separate committee which is appointed by the Board and which is composed of teachers and clinicians prominent in their own fields. All aspects of the testing program, including scoring and statistical analysis, are now carried on in the offices of the National Board. The third, or final, part of the examination provides a total of seven hours for each candidate to demonstrate his ability to apply his knowledge of clinical problems in four major elements of general practice. In each of these subjects time is provided for the candidate to study a patient or clinical specimens. He is then required to write an essay test based on the patient or the clinical specimen that he has studied. His essay paper is then reviewed by separate examiners in each subject. After this, the examiners question the candidate in other aspects of the subject.

Examinations in part 1 were held during 1957 in June and September and in part 2 in April and June. Part 3 of the examination is administered through subsidiary boards located in the major cities of the United States during the last two weeks of June of each year. Where indicated, interim part 3 examinations will be organized by an individual subsidiary board during the course of the year. The dates of all examinations are posted on medical school bulletin boards and published in THE JOURNAL and in "The National Board Examiner," the official publication of the National Board of Medical Examiners.

The National Board admits to its examination students in and graduates of approved medical schools in the United States and Canada. The National Board does not, at the present time, admit to its examination graduates of other medical schools. Upon receipt of a request initiated by a state licensing board, a specialty board, or a medical school, an individual trained in a foreign medical school may be admitted to the National Board examinations in order to satisfy special requirements or regulations of the licensing board, specialty board, or the medical school. He is not considered a candidate for a certificate but is admitted to the examination as a service to the agency requesting the service and the grades are sent only to the board or school concerned.

TABLE 39.—*National Board Examinations in Part 1, 1922-1957*

Date	Total Examinations	Passed	Incomplete	Failed	% Failed
June, 1957	2,796	1,865	742	189	9.2
September, 1957	1,020	416	569	35	7.7
Totals	3,816	2,281	1,311	244	8.9
	388	263	58	67	20.3
	507	349	77	81	18.8
24	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,867	1,204	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,865	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,832	2,337	1,243	243	9.4
1950	3,678	2,358	986	334	9.0
1951	3,520	2,153	1,038	329	9.3
1952	3,989	2,467	1,147	375	9.4
1953	4,278	2,866	980	432	13.0
1954	3,252	2,286	677	289	11.2
1955	3,196	1,735	1,173	288	14.2
1956	3,475	2,675	510	290	10.8
1957	3,816	2,281	1,311	224	8.9
Totals	78,515	48,173	23,001	7,341	13.2

In the following paragraphs data are presented regarding the examinations conducted and the issuance of certificates by the National Board. This is the 36th annual compilation of these statistics. The board's first examination was given in October, 1916. From that date and up to and including a test given in June, 1921, 11 examinations were given and 268 candidates were certified. Since 1922 the examination has been divided into three parts: part 1, a written examination in six basic science subjects; part 2, a written examination in five major clinical divisions and their component subjects or subdivisions; and part 3, a clinical and practical evaluation of the candidate's ability in observation, in diagnostic acumen, and in the principles of therapy, applicable to the four major elements of general practice, namely, clinical medicine, pediatrics, clinical surgery, and obstetrics and gynecology.

The results of examinations given in parts 1 and 2 during 1957 and for each year since 1922 are recorded in tables 39 and 40. The data shown in these tables represent examinations conducted rather than persons examined, and the figures thus include candidates who fail and are reexamined during the same year and those who may pass parts 1 and 2 in the same year.

In 1957, 3,816 examinations were given in part 1; 2,281 passed, and 224, or 8.9%, failed. There were 1,311 incomplete examinations given. In part 2, 2,151 examinations were held; 2,115 passed, and 18, or 0.8%, failed. Incomplete examinations are seldom given in part 2. There were 18 such examinations given in 1957.

Since 1922 a total of 78,515 examinations have been given in part 1 and 41,903 in part 2. During this period 48,173 passed part 1 and 40,231 part 2.

TABLE 40.—*National Board Examinations in Part 2, 1922-1957*

Date	Total Examinations	Passed	Incomplete	Failed	% Failed
April, 1957	1,936	1,910	12	14	0.7
June, 1957	215	205	6	4	1.9
Totals	2,151	2,115	18	18	0.8
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
1950	1,863	1,837	0	26	1.3
1951	2,045	2,017	0	28	1.4
1952	2,017	2,001	0	16	0.8
1953	2,200	2,145	1	54	2.4
1954	2,258	2,169	26	63	2.8
1955	2,220	2,181	3	36	1.6
1956	2,182	2,153	3	26	1.2
1957	2,151	2,115	18	18	0.8
Totals	41,903	40,230	97	1,576	3.8

In the 36-year period shown, there have been 7,341 failures in part 1 (13.2%) and 1,576 in part 2 (3.8%).

In 1957, 2,010 tests were given in part 3; 1,998 passed and 12 (0.6%) failed. Results of examinations in part 3 in 1955 and in the 35 preceding years are given in table 41. In 36 years, 36,663 were tested, of whom 35,825 were granted the certificate of the board. The percentage of failures in this final examination in 36 years was 2.3. The 1,998 physicians certified as diplomates in 1957 represented 65 medical schools in the United States, 8 in Canada, and 9 medical schools of other countries. The school and the number of examinees from each are included in table 42.

In 1957, there were 3,027 licenses to practice medicine issued by endorsement of the certificate of the National Board of Medical Examiners by 42 boards, the District of Columbia, Alaska, Canal Zone, Hawaii, and Peurto Rico. The number registered by each of these licensing boards is recorded in table 43. There have been 38,455 licenses issued on the basis of endorsement of the board's certificate by the various states, territories, and outlying possessions since 1915.

Table 41.—*National Board Examinations in Part 3, 1922-1957*

Year	Total Examinations	Passed	Failed	% Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
1950	1,752	1,736	16	0.9
1951	1,738	1,708	30	1.7
1952	2.128	2,036	92	4.3
1953	2,039	1,979	60	2.9
1954	2,133	2,052	81	3.8
1955	2,090	2,077	13	0.6
1956	2,085	2,072	13	0.6
1957	2,010	1,998	12	0.6
Totals	36,663	35,825	838	2.3

A number of medical schools use National Board examinations for their own purposes. In some schools the entire second-year class takes part 1 at the end of the second year; in others part 2 serves as a comprehensive examination at the end of the fourth year; in still other schools both parts 1 and 2 are taken by all students. At the present time there are 35 medical schools in which 25 or more students take National Board examinations. In 29 schools, the National Board examinations are required for the entire class for either part 1 or part 2 or both parts 1 and 2.

The officers of the board are Walter A. Bloedorn, M.D., President; Creighton Barker, M.D., Vice-President; John P. Hubbard, M.D., Executive Secretary and Treasurer; William V. Clemans, Ph.D., Director of Testing Services; Christian J. Lambertsen, M.D., Assistant Secretary; George D. Ludwig, M.D., Assistant Secretary; J. S. Rodman, M.D., Honorary Medical Secretary; and Everett S. Elwood, Consultant on State Board Relations.

Table 42.—*Diplomates from Individual Medical Schools, 1957*

United States

Medical College of Alabama	1
University of Arkansas	5
College of Medical Evangelists	33
Univ. of Southern California	3
Stanford University	7
University of California, L.A.	6
University of Colorado	1
Yale University	73
Georgetown University	104
George Washington University	85
Howard University	1
University of Miami	7
Medical College of Georgia	1
Chicago Medical School	77
Northwestern University	42
Stritch School of Medicine	18
Univ. of Chicago Sch. of Med.	40
University of Illinois	24
State University of Iowa	10
University of Kansas	9
University of Louisville	10
Tulane University	1
Johns Hopkins University	8
University of Maryland	5
Boston University	66
Harvard Medical School	121
Tufts Univ. Med. School	107
University of Michigan	8
University of Minnesota	2
St. Louis University	7
Washington University	11
Creighton University	38
University of Nebraska	4
Albany Medical College	48
State Univ. of N.Y., Brooklyn	146
University of Buffalo	63
Columbia University	118
Cornell University	70
New York Medical College	78
New York University	135
University of Rochester	53
State Univ. of N.Y., Syracuse	69
Duke University	4
Western Reserve University	31
Ohio State University	1
University of Oregon	10
Hahnemann, Philadelphia	7
Jefferson Medical College	9
Temple University	10
University of Pennsylvania	32
Woman's Medical College	13
University of Pittsburgh	2
University of Tennessee	3
Meharry Medical College	1
Vanderbilt University	1
University of Texas	2
Baylor University	1
University of Utah	2
University of Vermont	32
University of Virginia	2
Medical College of Virginia	1
University of Washington	3
University of Wisconsin	4
Marquette University	4
University of Puerto Rico	26
Total.	1,916

Canada

University of Manitoba	3
Dalhousie University	2
Queen's University	3
University of Ottawa	6
University of Western Ontario	1
University of Toronto	4
McGill University	50
University of Montreal	1
Total	70

Foreign

University of Leige, Belgium	1
University of Kobenhavns, Denmark	1
University of Frankfurt, Germany	1
University of Rome, Italy	1
University of Leiden, Netherlands	3
University of Philippines	1
University of Bern, Switzerland	2
University of Geneva, Switzerland	1
University of Zurich, Switzerland	1
Total	12

The address of the board is 133 S. 36th st., Philadelphia 4.

Table 43.—*Licenses Granted on the Basis of National Board Certificates, 1957*

Alabama	9
Arizona	16
California	585
Colorado	26
Connecticut	172
Delaware	5
Dist. Columbia	15
Georgia	15
Idaho	9
Illinois	121
Iowa	16
Kansas	8
Kentucky	27
Maine	25
Maryland	83
Massachusetts	249
Michigan	24
Minnesota	70
Mississippi	5
Missouri	22
Montana	3
Nebraska	1
Nevada	3
New Hampshire	22
New Jersey	89
New Mexico	3
New York	921
North Carolina	2
North Dakota	2
Ohio	92
Oklahoma	6
Oregon	18
Pennsylvania	114
Rhode Island	26
South Carolina	4
Tennessee	13
Utah	14
Vermont	23
Virginia	42
Washington	31
West Virginia	17
Wisconsin	24
Wyoming	4
Alaska, Canal Zone, Hawaii and Puerto Rico	51
	3,027

References

1. J. A. M. A. **164**:419 (May 25) 1957.

2. Forty-eight state boards, the District of Columbia, Alaska, the Canal Zone, Guam, Hawaii, and Puerto Rico.

ORGANIZATION SECTION

A. M. A. SAN FRANCISCO BROADCASTS

For the first time in A. M. A. history, highlights of an annual meeting will be broadcast daily to the general public via television and radio. Programs will be presented next month in San Francisco as a public service by the A. M. A. in cooperation with the Merck, Sharp & Dohme pharmaceutical company over commercial radio station KROW (960 kilocycles) and KQED, educational television Channel 9. A full hour preview of the meeting, entitled "Salute to San Francisco" and featuring interviews and statements of medical leaders, will be telecast at 5:30 p. m. Sunday, June 22. Thereafter, daily through Thursday, summaries of scientific material and other convention news will be telecast from 5:30 to 6 p. m. Radio broadcasts covering the previous day's events as well as planned activities for the coming day will be presented Monday through Friday of convention week from 7:30 to 7:45 a. m. All news items will emanate from the A. M. A. press room in the Palace Hotel, and will be broadcast from the respective studios. Production is being handled by the California Academy of Sciences. Plans call for presenting the material in a manner which will adequately summarize convention happenings for both the general public and physicians attending the sessions. Kinescopes of the television shows will be edited as a one-hour film for later distribution to county and state medical associations.

NEW A. M. A. PUBLICATIONS

A new A. M. A. leaflet entitled "The Fifth Freedom," points out that it is every American's basic right to choose not only where he will live or the church he will attend but also the physician in whom he has the greatest confidence. Free choice and mutual understanding are essential to the formation of a good doctor-patient relationship. This leaflet was distributed in May to state and county medical societies.

"Suggested Guides for Medical Society Committees on Aging" is the title of a booklet being prepared by A. M. A. Committee on Aging for use by state and county medical societies. It contains suggestions on (1) purposes of a medical society committee on aging; (2) membership and format; (3) tenure of members; (4) meetings; and (5) activities. Copies of the pamphlet will be available from the Council on Medical Service.

The new edition of the A. M. A. booklet, "Voluntary Prepayment Medical Benefit Plans," will be available from the Council on Medical Service early in June. In addition to a description of plans having medical society approval, this edition of the brochure will contain data on the growth of such plans and a resumé of new developments in the field.

NEW A. M. A. NEWSPAPER

Publication of a bi-weekly tabloid newspaper to keep American Medical Association members informed of socioeconomic and other nonscientific happenings of special interest to physicians will begin this fall, according to General Manager F. J. L. Blasingame. The 16-page paper will be produced by a staff of experienced journalists centered at headquarters in Chicago. The duties of editor have been assumed by Jim Reed, who comes to the A. M. A. from the executive editorship of the Topeka *Daily Capital,* where he served for eight years. Mr. Reed has worked with the Kansas Medical Society in developing a code to promote a better flow of information between the medical profession and various news media. Last year the Kansas Bar Association honored him "for the most constructive contribution to the science of jurisprudence and administration of justice by a Kansas newspaperman." As editor of the new *A. M. A. News,* Mr. Reed will report directly to Dr. Blasingame and will be responsible for the editorial phases of the tabloid's operation. Production, circulation, and the sale of advertising will be handled from the A. M. A. Business Manager's office.

QUARTERLY CUMULATIVE INDEX MEDICUS

Volume 58 of the Quarterly Cumulative Index Medicus, covering literature for the last half (July-December) of 1955, has been mailed to subscribers and is now available for purchase from the Order Department of the American Medical Association. Reprints of the list of periodicals and publishers from this volume are also in stock. These sell for 75 cents each. Editing and reproduction of copy for volume 59 is in progress at present.

MEDICAL NEWS

ALABAMA

Plan Research Building for Health Sciences.—Construction has begun on the health sciences research building at the Medical College of Alabama, Birmingham. The building was made possible by the passage of an amendment in the state-wide election Dec. 17 which made funds available to match an award of $1,033,000 of federal monies. In 1948 the annual value of gifts and grants for research and training to the Medical Center was about $30,000. This amount has increased to about $1,000,000 a year. The availability of the research building will permit the expansion of present programs and will stimulate the recruiting of health scientists to the center. The location of the building will be unique in that it will span 7th Avenue on the east side of 19th Street. This will achieve the physical union of all of the major units of the center. The building is expected to be ready for occupancy in the fall of 1959.

CALIFORNIA

Grant for Research at Stanford.—A $2,680,000 endowment to Stanford Medical School has been established through the estate of Mrs. Sophie K. Hall of Los Angeles. The bequest, income from which will support the Lendal M. Gray research fund, named for Mrs. Hall's first husband, is the largest single gift from an individual since the founding grant of Senator and Mrs. Leland Stanford in 1885. The fund is to be used for research in medicine at Stanford.

Hospital News.—The air-conditioned surgical and central service departments in the new wing of the Saint Francis Memorial Hospital have been opened. The new surgical department comprises the entire second floor, and includes four major and six minor surgical rooms and two cystoscopic rooms. The new wing will also house the new Psychiatric Unit, which will supplement the outpatient clinic opened by the hospital the first of the year. Facilities have been provided for a new obstetrical and gynecological department, a new radiological department, and additional clinic services, to be built as soon as funds are available.——Dr. Dwight H. Murray, past-president of the American Medical Association, was the luncheon speaker at the first symposium and convocation of the new Memorial Hospital of Long Beach medical staff May 21 at Seaside Hospital. The new Memorial Hospital building was officially started on May 18, when groundbreaking ceremonies were held, and the symposium was conducted as part of the celebration. Seaside Memorial Hospital will operate the new 400-bed facility.

DISTRICT OF COLUMBIA

Dr. Hussey Named Dean at Georgetown.—Dr. Hugh H. Hussey Jr., director of the department of medicine, has been appointed dean of the Georgetown University School of Medicine, effective July 1. Dr. Hussey succeeds Dr. Francis M. Forster, who is resigning the post to devote all his time to neurology, but will remain as professor and director of the department of neurology, a position he has held along with the deanship. Dr. Hussey is the medical editor of *GP* and associate editor of *Medical Annals of the District of Columbia.* For 16 years Dr. Hussey was chief of the Georgetown Division at District of Columbia General Hospital.

FLORIDA

Outbreak of Typhoid Fever.—The U. S. Public Health Service's Morbidity and Mortality Weekly Report released May 9, notes that Dr. James O. Bond, Florida State Board of Health, reported during the first week in April, three proven cases of typhoid fever due to *Salmonella typhi*, type E_1, in children 6, 7, and 8 years old in Florida. The three boys were associated at school and at home and gave histories of having been swimming in a small stream that carries untreated sewage from another section of the town. No other potential sources of the disease were discovered in an investigation which included an exhaustive survey for carriers among contacts. The three cases were asymptomatic two weeks after initial treatment with a broad-spectrum antibiotic. There are no carriers of *S. typhi* noted in the records for this area, but a search is being carried out by retrograde investigation of the sewage system.

GEORGIA

Appointment to Cardiovascular Research Chair.—Dr. Elbert P. Tuttle Jr. has been named to the chair of cardiovascular research in the Emory University School of Medicine, Atlanta, where he has been an assistant professor of medicine since July, 1957. Appointed Research and Clinical Fellow in Medicine at Harvard in 1953, he was made assist-

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

ant in medicine in charge of the renal physiology laboratory in 1955 and during this period, he was also a research fellow for the National Heart Institute. Dr. Tuttle's investigations for the next several years will be devoted to the relation between high blood pressure, the excretion of salt by the kidney, and the output of the heart. The Georgia Heart Association provides partial support for the position in cardiovascular research.

ILLINOIS

Seminars in Psychiatry.—The last two seminars in the present series on "Modern Concepts in Psychiatry" held at the Veterans Administration Hospital, owney, are as follows:

une 18—"The Question of Manic Depressive Psychoses." Lecturer: Dr. Donald W. Hastings, department of psychiatry and neurology, The Medical School, University of Minnesota, Minneapolis.
June 25—"Psychopharmacology I and II." Lecturer: Dr. Lester H. Rudy, superintendent, Research Hospital, Galesburg, Ill.

For information write Dr. Arpad Paunez, Assistant Director, Professional Services for Research and Education, Veterans Administration Hospital, Downey, Ill.

Chicago

Award of Dermatology Fellowship.—The 1958 Toni-Gillette fellowship in dermatology at Northwestern University Medical School has been awarded to Dr. Fred Levit, of Chicago, a second-year resident. Dr. Levit who was selected by the fellowship committee will conduct research under the direction of Dr. Herbert Rattner, chairman of the dermatology department. Last year, Dr. Levit was engaged in dermatology work at the Veteran's Administration Research Hospital, prior to which he was in general practice. The fellowship, which is renewable for one year at the discretion of the school, was established in 1957 by the Toni Company. It provides that the nominee receive $2,500 if married, $2,000 if single, and an additional $1,500 goes to the university to defray tuition and departmental overhead expenses.

Physicians Honored for Hospital Service.—Ten physicians with a total of 491 years on the staff of Englewood Hospital received scrolls honoring them for "diligent and humane service" at the annual staff banquet. A scroll was to have been presented to Dr. Charles R. Benner, 78, who died April 29. The hospital began in two rooms in 1894 with four beds and today has 160 beds and facilities for 34 babies. Six physicians received their scrolls at the banquet: William L. Gregg (47 years with the hospital); Charles S. Salmon (50 years); Carleton S. Myers (55 years); Ira E. Greenburg (48 years); Simon H. Ash (40 years); and Nathaniel I. Baskind (45 years). Four were honored in absentia: Meyer Solomon (49 years); August C. King (44 years); John K. McQuarrie of Palos Park (63 years); and Frank M. Phifer, Kankakee (50 years). Dr. McQuarrie, who has the longest term of service of any staff member, and who took his first patient to the hospital in 1895, is still active in hospital affairs.

IOWA

Memorial to Dr. Downing.—The dedication of the Dr. James A. Downing Memorial Room at Raymond Blank Hospital for Children, in Des Moines, was held April 14. The room, which will be used as an eye, ear, nose and throat examination and treatment center, was equipped by the Raymond Blank Guild from funds contributed in memory of the late Dr. Downing. Dr. Charlotte Fisk, of the hospital's pediatric staff, and Dr. Lee Forrest Hill, chief pediatrician, made the presentation, and Mr. Donald W. Cortes, the administrator, accepted the gift on behalf of the hospital. Dr. Downing died in December, 1956. He was on the teaching staff, Iowa Methodist Hospital, and chief of the department of otolaryngology from the time of its creation.

Study of Blood in South Africa.—Dr. Joseph A. Buckwalter, associate professor of surgery, State University of Iowa, left recently to conduct a study of the relationship of blood types to various diseases among four racial groups in the Union of South Africa, which will be supported by a grant from the National Institute of Arthritis and Metabolic Diseases of the U. S. Public Health Service. Begun in May to continue for four months, the study will be an extension of a program which a team of scientists has conducted at the university since 1955. Chief collaborators with Dr. Buckwalter have been Dr. Robert T. Tidrick, professor and head of surgery, and Prof. Lloyd A. Knowler, chairman of mathematics. The aim of the investigation is to determine whether any significant relationship exists between the frequency of certain kinds of cancer and other diseases. With the collaboration of Dr. Allan E. Kark, professor of surgery, University of Natal, Dr. Buckwalter will gather information from the four racial groups. The study also has received financial support from the Iowa Division, American Cancer Society, and two pharmaceutical companies which provide materials.

MARYLAND

State Medical Election.—The Medical and Chirurgical Faculty of the State of Maryland has announced that the following were elected to take office after the next annual meeting in April, 1959: president, Dr. Leslie E. Daugherty, Cumberland; vice-presidents, Dr. Robert W. Farr, Chestertown, Dr. Page C. Jett, Prince Frederick, Dr. Samuel

Morrison, Baltimore; secretary, Dr. William C. Ebeling, Baltimore; and treasurer, Dr. Wetherbee Fort, Baltimore.

Annual Diabetes Award.—Dr. James B. Field, of the National Institute of Arthritis and Metabolic Diseases, Bethesda, will be presented with the 1958 (second) Lilly Award at the 18th annual meeting of the American Diabetes Association June 21-22, in San Francisco. The annual award, supported by Eli Lilly and Company, consists of $1,000 and a medal. Its purpose is to recognize demonstrated research in the field of diabetes. Dr. Field is currently engaged in postdoctoral studies in London, England.

Personal.—Dr. Caroline A. Chandler, assistant professor of pediatrics, Johns Hopkins University School of Medicine, Baltimore, has been appointed chief of the Division of Maternal and Child Health of the State Health Department.——Dr. James A. Shannon, director, National Institutes of Health, Bethesda, received the New York University College of Medicine Alumni Association 1958 scientific award for "outstanding achievements in the fields of renal physiology, malarial control and national administration of medical research." He was principal speaker on Alumni Day, Feb. 22.——Dr. Harry Eagle, chief, Section on Experimental Therapeutics, National Institute of Allergy and Infectious Diseases, Bethesda, gave the 11th annual Jack H. Tritt Memorial Lecture at Jewish Hospital, St. Louis, March 4, on "Amino Acid Metabolism in Tissue Culture."

MICHIGAN

Lectureship to Honor Dr. Selby.—The St. Clair County Medical Society has established an annual lectureship in honor of Dr. Clarence D. Selby, of Port Huron. Dr. Selby, who retired as secretary of the medical society, was honored by the group at a dinner recently. He has acted as medical consultant to General Motors Corp., was active in industrial health work with the U. S. Public Health Service, and has served as president of the Ohio State Medical Association and president of the American Association of Industrial Physicians (now known as the Industrial Medical Association). Dr. Selby has received the William S. Knudsen award, the distinguished service citation from the A. M. A. (1954), and the Michigan State Medical Society award (1951).

Japanese Honor Two Wayne Surgeons.—Two Detroit physicians were among three honored by the Japanese Surgical Society meeting in Fukuoka recently. For the first time in its history the Japanese Surgical Society invited foreign guests to its annual meeting, April 23-25. The three so honored were Drs. Charles G. Johnston and Grover C. Penberthy, of the Wayne State University surgical department, and Geheimrat Prof. Dr. Robert Warnke, of the Medical Faculty of Kiel, Germany. Dr. Johnston, head of the surgical department, presented a paper before the Japanese society on the "Solution of Gallstones." During the remainder of his visit, he will serve as consultant at Keio University (Tokyo) on the residency training program there. Drs. Johnston and Penberthy sailed from Los Angeles, April 7, arrived in Yokohama, April 21, and are expected back in the United States early in June.

MISSISSIPPI

Dr. Underwood to Retire.—The evening of June 23 has been set for an appreciation dinner for Dr. Felix J. Underwood, who will retire June 30, after over 40 years of public health service in his native state. His friends are invited to this event, sponsored by public health workers of Mississippi. Clayton Rand, nationally known writer, will be the featured speaker for the occasion. Dr. Norris C. Knight, director, Division of Health Education, is general chairman of the committee-in-charge. The dinner will be at 6:30 p. m. in the Victory Room of the Heidelberg Hotel, Jackson. Reservations may be made by sending a check payable to "Felix J. Underwood Appreciation Dinner" ($4 per person) to Miss Cleta Brinson, Box 1700, Jackson, Miss.

MONTANA

Anesthesiologists Organize.—On April 18, Montana anesthesiologists organized the Montana Society of Anesthesiologists. Dr. Richard B. Griffing, Great Falls, was named president; Dr. Leonard E. Kuffel, Missoula, vice-president; and Dr. Warren R. Rupper, Billings, secretary-treasurer.

OHIO

Surgical Meeting in Cincinnati.—The fifth annual scientific meeting of the Ohio State Surgical Association will be held June 4-5 at the Netherland Hilton Hotel, Cincinnati. A panel discussion, "Surgery of the Patient with Jaundice," will be moderated by Dr. Max M. Zinninger, Cincinnati. The program includes the following topics by out-of-state speakers:

Angioplastic Procedures in the Management of Peripheral Occlusive Arterial Disease, Dr. D. Emerick Szilagyi, Detroit.
Carcinoma of the Cervix—Present Concepts of Early Diagnosis and Therapy, Dr. Richard W. Te Linde, Baltimore.
Pitfalls in Treatment of Ankle Injuries, Dr. Harrison L. McLaughlin, New York City.
Trends in the Management of Cancer of the Colon and Rectum, Dr. Henry K. Ransom, Ann Arbor, Mich.
Surgical Treatment for Peptic Ulcer, Dr. Ralph F. Bowers, Memphis, Tenn.
Chronic Pancreatitis with Special Reference to Caudal Pancreaticojejunostomy, Dr. Charles B. Puestow, Chicago.

Entertainment includes golf, tennis, swimming, a dinner-dance, and a ladies' program. For information write Dr. Clyde S. Roof, 5 W. 4th St., Cincinnati 2.

OREGON

Plague in a Ground Squirrel.—The U. S. Public Health Service's Morbidity and Mortality Weekly Report released May 9 notes that F. M. Prince, San Francisco Field Station, Public Health Service, has reported that *Pasteurella pestis* was isolated from specimen 1243-A, a ground squirrel, found dead April 11 on a ranch located 15 miles ease of Klamath Falls, Ore.

SOUTH CAROLINA

Narcotics Violation.—The Bureau of Narcotics, Treasury Department, has reported that "Dr. Oliver W. Williamson [of Wagener] pleaded guilty in the United States District Court at Charlotte, North Carolina, to a violation of USC Title 18, Section 371, and on April 11, 1958, his sentence of three years was suspended and he was placed on probation for a period of five years, and fined $10,000."

WYOMING

Annual State Meeting in Moran.—The 55th annual meeting of the Wyoming State Medical Society will be held June 11-14 at Jackson Lake Lodge, Moran. Two morning panel discussions (June 12 and 14) are planned on "Cancer" and "Combined Orthopedic Pediatric Problems," moderated by Drs. Joseph E. Hoadley and Lawrence J. Cohen, respectively, and with Dr. Clare C. Wiley, president, Colorado State Medical Society, presiding at the June 14 session. The following guest speakers are listed: Col. Levi M. Browning, M.C., U.S.A.F., Denver; Dr. Charles H. Flint, Thermopolis; Dr. David A. Karnofsky and Dr. Samuel W. Moore, New York City; Dr. Ralph V. Platou and Dr. Jack K. Wickstrom, New Orleans; and Dr. Richard L. Sutton Jr., Kansas City, Mo. Question-and-answer periods will be held. Exhibits and a ladies' program are planned and a dinner-dance will be held June 13, 6:30 p.m. Registration fee is $20. For information write Mr. Arthur Abbey, Executive Secretary, Wyoming State Medical Society, Box 2036, Cheyenne, Wyo.

GENERAL

National Youth Fitness Week.—A proclamation by the President of the United States of America concerning National Youth Fitness Week reads as follows:

> WHEREAS the youth of our Nation constitutes one of our most valuable assets; and
>
> WHEREAS the scientific and technological advances of recent years have eased the problems and hardships of everyday living and have lessened the need for physical activity on the part of our young people, with a consequent adverse effect on the health of our Nation; and
>
> WHEREAS the Chairman of the President's Council on Youth Fitness, established in July 1956 to stimulate existing programs and to initiate other measures tending to enhance the fitness of American youth, has recommended that the week beginning June 1, 1958, be designated as National Youth Fitness Week; and
>
> WHEREAS the fitness of our young people can be promoted through the determined and constant effort of all our citizens, both young and old:
>
> NOW, THEREFORE, I, DWIGHT D. EISENHOWER, President of the United States of America, do hereby proclaim the week beginning June 1, 1958, as National Youth Fitness Week.
>
> I request officials of the Government, and I urge American parents, . . . and civic groups, to use all appropriate means during that week to promote programs and activities which will better the mental, social, spiritual, and physical fitness of the youth of America to the end that we may assure the continuing strength and well-being of our Nation.

Staphylococcal Food Poisoning.—The U. S. Public Health Service's Morbidity and Mortality Weekly Report released May 9 notes that Dr. Dean H. Fisher, Maine Department of Health and Welfare has reported an outbreak of staphylococcal food poisoning in five persons after eating cream pies. Symptoms developed in from two to four hours. Conditions at the bakery were unsanitary. The pies were not refrigerated. Several samples of cream pies showed *Staphylococcus aureus*. Nose and throat cultures from several of the food handlers showed *Staph. aureus* and other pathogens.

The California State Department of Health has reported staphylococcal food poisoning in five persons who became ill with nausea, vomiting and diarrhea three to six hours after eating barbecued ham. Symptoms lasted about 12 hours. The canned ham remained in the can under refrigeration until it was barbecued, then in about an hour, it was wrapped in aluminum foil and left out of refrigeration for four hours. The ham was then refrigerated for 20 hours and after another 2½ hours without refrigeration it was eaten. A sample of ham produced a plate count of 7×10^6 colonies per gram of pathogenic staphylococci.

Dr. Corner Wins Passano Foundation Award.—The board of directors of the Passano Foundation has announced that Dr. George W. Corner, of the Rockefeller Institute for Medical Research, has been selected as the recipient of the $5,000 Passano Foundation award for 1958. On June 25, during the convention of the American Medical Association in San Francisco, a reception and dinner will be held at the St. Francis Hotel to honor Dr. Corner. Dr. Gunnar Gundersen, incoming President of the American Medical Association, will speak on the Contribution of Fundamental Research to Clinical Medicine. Dr. Herbert M. Evans, a former award winner, will appraise Dr. Corner's contribution to science. This year's award is presented to Dr.

Corner "for his long and continuing researches and their many fruitful contributions to the better understanding of mammalian anatomy and physiology, with particular emphasis on human reproduction." From 1940 until his retirement in 1955, Dr. Corner was director of the department of embryology at the Carnegie Institution, New York City. The Passano Foundation was formed late in 1943, to encourage medical science and research, particularly that having a clinical application. It is sustained by annual contributions from The Williams and Wilkins Company, publishers of medical and scientific books.

Section Meeting of Insurance Physicians.—The Medical Section of the American Life Convention, an association of legal reserve life insurance companies of the U. S. and Canada, will hold its 46th annual meeting at the Broadmoor, Colorado Springs, Colo., June 9-11. Panel discussions under the general heading "What Would You Do?" will consider the following: respiratory system, endocrine system, cardiovascular system, and the neurological system. The following papers are scheduled:

Are We Facing our Responsibilities as Medical Directors?, Dr. John E. Boland, Chicago.
Coronary Occlusion and Chest Pain, Dr. Harry A. Cochran Jr., Fort Wayne, Ind.
Are You Meeting Your Responsibility in the Field of Accident and Health Insurance?, Mr. E. J. Faulkner, president, Woodmen Accident and Life Company, Lincoln, Neb.
Allergies, Dr. John M. Sheldon, Ann Arbor, Mich.
Cardiovascular Disease, Dr. Edgar V. Allen and Dr. Robert L. Parker, Rochester, Minn.

Dr. Ernest B. Howard, assistant general manager, A. M. A., and Dr. Norman J. Barker, president, The Association of Life Insurance Medical Directors of America, will present addresses at the opening session. Facilities for golf, swimming, and tours are available, and a ladies' program is arranged. For information write the American Life Convention, 230 N. Michigan Ave., Chicago 1.

American Surgeons Meeting in Stockholm.—The final 1958 sectional meeting of the American College of Surgeons will be held for the first time in Stockholm, Sweden, July 2-7. The Swedish Surgical Society will be host to the meeting; headquarters will be Concert Hall. Visitors from America may arrange for travel accommodations by air or aboard the S. S. Statendam, sailing from New York City June 20, for a cruise which will stop for clinical visits at Oslo and Gothenburg en route to Stockholm, also holding some sessions aboard ship. Dr. Oscar O. Schuberth, Stockholm, associate professor surgery, Karolinska Institutet, is chairman of the advisory committee on local arrangements. The program will include hospital demonstrations, clinics, medical motion pictures, and panel discussions, symposiums, and scientific papers in general surgery and the specialties of orthopedic surgery, obstetrics and gynecology, ophthalmology, otolaryngology, and urology. Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 E. Erie St., Chicago 11, is in charge of the sectional meeting program for the college.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

	May 3, 1958		May 4, 1957
Area	Paralytic Type	Total Cases	Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	..	..	..
Middle Atlantic States			
New York	..	1	..
New Jersey	..	..	..
Pennsylvania	..	..	..
East North Central States			
Ohio	..	1	1
Indiana	..	..	1
Illinois	..	..	2
Michigan	..	..	..
Wisconsin	..	1	1
West North Central States			
Minnesota	..	..	..
Iowa	..	2	..
Missouri	..	..	..
North Dakota	..	1	..
South Dakota	..	..	..
Nebraska	..	..	..
Kansas	..	..	1
South Atlantic States			
Delaware	..	..	..
Maryland	..	..	..
District of Columbia	..	..	..
Virginia	..	..	..
West Virginia	..	2	..
North Carolina	..	..	1
South Carolina	..	..	..
Georgia	..	..	..
Florida	..	2	..
East South Central States			
Kentucky	1	1	..
Tennessee	..	..	1
Alabama	..	..	..
Mississippi	..	..	..
West South Central States			
Arkansas	..	..	..
Louisiana	..	..	2
Oklahoma	1	1	..
Texas	5	6	15
Mountain States			
Montana	..	..	1
Idaho	..	..	..
Wyoming	..	..	..
Colorado	..	..	..
New Mexico	..	..	..
Arizona	..	..	2
Utah	..	..	1
Nevada	..	..	..
Pacific States			
Washington	..	..	..
Oregon	..	..	..
California	..	1	8
Territories and Possessions			
Alaska	1	1	..
Hawaii	..	..	..
Puerto Rico	1	1	..
Total	9	21	27

Awards for Research in Aging.—The trustees of the Ciba Foundation have announced the fifth and final annual awards for 1959 for experimental research into problems of aging. Candidates should note:

(a) Not less than five awards, of an average value of £300 each, are available for 1959. The announcement of awards will be made in August, 1959.
(b) Entries must be received not later than Jan. 10, 1959.
(c) Entries will be judged by an international panel which will advise the executive council of the foundation on their findings and will also have power to recommend variation in the size and number of the awards according to the standard of entries. The decisions of the executive council will be final.
(d) Preference will be given to younger workers.
(e) Papers may be in the candidate's own language, papers should not be more than 7,000 words in length, and in all cases a summary in English not exceeding in words 3% of the length of the paper must be attached. If possible, 10 copies of reprints in English should be provided.
(f) Where there is one or more co-author, the name of the leading author should be indicated; it is to him that the award will normally be made.

For copies of regulations and applications write Dr. Gordon E. W. Wolstenholme, Director, and Secretary to the Executive Council, Ciba Foundation, 41 Portland Place, London, W.1., England.

Dermatologists Meeting in Idaho.—The 78th annual meeting of the American Dermatological Association, Inc., will be held June 4-7 at the Challenger Inn, Sun Valley, Idaho. The presidential address, "Dermatology's Debt to Dermato-Histopathology," will be presented by Dr. Clark W. Finnerud to open the scientific session. As part of the report of the Research Aid Committee of the association, Dr. Thomas B. Fitzpatrick will present "The Nature of Hair Pigment." Twenty-five papers are scheduled with discussions to follow, including "Smooth Muscle Tumors of the Skin," by Dr. Hamilton Montgomery, vice-president of the association. The presidents' party will be held June 4, 6:30 p.m. For information write The American Dermatological Association, Inc., Dr. Jasper L. Callaway, Secretary, Duke Hospital, Durham, N. C.

Courses for Prosthetic Technicians.—Two 9-month training courses, for orthopedic and prosthetic technicians, will be offered jointly by the Institute for the Crippled and Disabled, the Presbyterian Hospital in the City of New York, and Columbia University, New York City. The courses will begin Sept. 8, 1958 and end June 27, 1959. Candidates are being accepted from all parts of the world in an effort to meet the international shortage of qualified brace- and limb-making technicians. Persons accepted for the courses will train at the institute, a rehabilitation center at 23rd Street and First Avenue in New York City. Academic instruction and practical experience in the making of braces and artificial limbs, and in working with patients, will take place. Time will be spent in clinical field training at leading hospitals and other institutions. The curriculums for the two courses has been prepared by the combined physical medicine and rehabilitation staffs of the institute, Columbia University, and the Presbyterian Hospital on the basis of two previous pilot courses. The courses will be conducted under the supervision of Charles R. Goldstine, C.P.O., director of the institute's Prosthetic and Orthopedic Laboratories. Application forms may be obtained from the Institute for the Crippled and Disabled, 23rd Street at First Avenue, New York 10.

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Eastern Psychiatric Meeting.—The 14th scientific meeting of the Eastern Psychiatric Research Association will be held June 5, 8 p.m., at the Alumni Hall, New York City. "The Suicidal Risk in the Municipal General Hospital" will be presented by Drs. Jacob H. Friedman and Remo Cancellieri, with discussion by Dr. Louis Wender. Dr. Eugene Revitch will give "Psychomotor Paroxysms of Non-Epileptic Origin" after which an open discussion on "Is Marsilid A Dangerous Drug?" will be held. For information write the Eastern Psychiatric Research Association, c/o Dr. David J. Impastato, 40 Fifth Ave., New York City.

Announce Nutrition Fellowship.—The National Vitamin Foundation invites individuals holding doctorate degrees in medicine or one of the biological sciences, interested in continuing training in nutrition, to become candidates for a National Vitamin Foundation—Russell M. Wilder Fellowship. This fellowship was created by the foundation to honor Dr. Russell M. Wilder, of the emeritus staff of the Mayo Clinic, for his more than 40 years of service and contributions to medicine and public health. The fellowship is for three years and pays the recipient $4,500 the first year, $5,000 the second, and $5,500 the third year. It becomes effective July or September, 1959. Applications may be obtained from the offices of the National Vitamin Foundation at 149 E. 78th Street, New York 21. Candidates must mail their completed applications to the foundation before Sept. 1. Applications must be accompanied by a letter from the executive officer of the institution where the work is to be done and by a letter from the head of the department under which the candidate is to work, attesting to the fact that the candidate will be permitted and encouraged to carry on his work and studies in the institution and department indicated. The candidate must outline a program of study which must be approved by his preceptor. The candidate must give reasonable assurance that he will complete his fellowship and continue to work in the field of metabolism and nutrition.

Congress on Radiation Research.—An International Congress of Radiation Research will be held at the University of Vermont, Burlington, Aug. 10-16 under the joint sponsorship of the National Academy of Sciences-National Research Council and the Radiation Research Society in cooperation with the European Committee on Radiobiology. The congress is being organized "to provide an international forum for an interdisciplinary attack on the broad area of radiation research." Under the chairmanship of the congress president, Dr. Alexander Hollaender, of Oak Ridge National Laboratory, the following symposiums are scheduled:

Aug. 12—Role of Oxygen and Peroxides in Radiation Chemistry: Analysis and Correlation of Various Radiobiological Actions on the Same Cell Species (Yeast).
Aug. 13—Free Radicals Produced by Irradiation.
Aug. 14—Late Effects of Irradiation in Mammals.
Aug. 15—Induced Changes in DNA and in Chromosome Structure.

Information concerning the presentation of papers, registration, and housing may be obtained from Harvey M. Patt, Ph.D., Secretary General, International Congress of Radiation Research, Argonne National Laboratory, Post Office Box 299, Lemont, Ill.

Society News.—At the 40th annual meeting of the American Radium Society the following officers were elected: president, Dr. Milford D. Schulz, Boston; president-elect, Dr. Theodore R. Miller, New York City; secretary, Dr. Robert L. Brown, Atlanta, Ga.; treasurer, Dr. Jesshill Love, Louisville, Ky.; first vice-president, Dr. Theodore P. Eberhard, Ann Arbor, Mich.; second vice-president, Dr. James F. Nolan, Los Angeles. The following are dates and sites for future meetings of the society: 1959: Hot Springs, Va., The Homestead, April 6-8; 1960: San Juan, Puerto Rico, March 17-19; 1961: Colorado Springs, Colo., The Broadmoor, May 11-13.——At its annual meeting in March, the Aero Medical Association installed the following officers: president, Brig. Gen. Major S. White, M.C., U. S. A. F.; president-elect, Dr. Ludwig Lederer, medical director, Capital Airlines; first vice-president, Dr. George J. Kidera, medical director, United Air Lines; and vice-presidents, air vice-marshal Chua Punsoni, surgeon general, Royal Thailand Air Force; Dr. Birger Hannisdahl, Oslo, Norway; Dr. Earle G. Wight, medical director, Canadian Pacific Airlines; and Dr. Thrift G. Hanks, director of health and safety, Boeing Airplane Company, Seattle.——The new officers of the American Academy of General Practice are: Drs. Holland T. Jackson, Fort Worth, Texas, president; Charles C. Cooper, St. Paul, Minn., vice-president; Fount Richardson, Fayetteville, Ark., president-elect; Albert E. Ritt, St. Paul, Minn., treasurer; and Mac F. Cahal, J. D., Volker Boulevard at Brookside, Kansas City, Mo., executive director.

Six Physicians to Receive Travel Awards.—Six physicians from the United States and abroad have been named as recipients of Purdue Frederick Medical Achievement Travel Awards "for outstanding medical and scientific activities." The awards will enable the winners to attend medical meetings of their choice here and in Europe. The announcement was made by the International Council for Health and Travel, a panel of medical specialists who administer the awards on behalf of The Purdue Frederick Company, pharmaceutical firm. Two of the award winners are from the U. S., both of the University of Minnesota: Dr. C. Walton Lillehei, of the School of Medicine, and Dr. Edgar V. Allen, professor of medicine, Mayo Foundation Graduate School. The winners from abroad will visit medical research and teaching centers and hospitals here and attend symposiums during April and May. Scheduled to participate in the Fifth International Congress on Internal Medicine in Philadelphia are: Dr. Robert B. Hunter, M.B.E., department of pharmacology and therapeutics, Queens College, Dundee, Scotland; and Dr. Haqvin Malmros, director, department of medicine, University of Lund, Sweden. Recipients planning to attend the World Congress of Gastroenterology in Washington, D. C. are: Dr. E. C. Faust, department of medicine, University of Valle, Cali, Colombia; and Dr. Andre Charbonnier, Paris, of the French National Society of Gastroenterology. These six awards are presented for the first half of 1958. Plans are for this program to continue, with awards presented on a once-a-month basis.

Mental Hospital Aides Cited.—"For their kindness, skill and patience in caring for patients," 126 ward attendants were selected in mental hospitals throughout the U. S. for citations by the National Association for Mental Health. Each winner has received an NAMH gold pin and a certificate of achievement. The recipients, 70 women and 56 men, represent 126 mental hospitals in 39 states and

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Congresses on Tropical Medicine and Malaria in Lisbon.—The sixth International Congresses on Tropical Medicine and Malaria will be held under the sponsorship of the Portuguese Government Sept. 5-13 in Lisbon, Portugal, where the Instituto de Medicina Tropical will be the executive body. The official languages will be Portuguese, French, English, and Spanish. Free discussions will be held at the end of each of the following subdivisions:

- Tropical Medicine:
  - Helmintic Infections.
  - Protozoal Infections.
  - Bacterial and Mycotic Infections.
  - Virus and Rickettsial Infections.
  - Tropical Physiology.
  - Tropical Hygiene and Sanitation.
  - General.
- Malaria:
  - Parasitology.
  - Clinical.
  - Epidemiology and Control.
  - Malaria Erradication.

The Laveran Prize will be awarded to the best paper on malaria submitted to the congresses. A historical-bibliographical exhibit, tours, and a program of social events are planned. Accomodations will be provided at the Lisbon and Estoril hotels. For information write the Secretary General, Dr. Manuel R. da Cunha Pinto, Instituto de Medicina Tropical, Lisbon, Portugal (cable: MEDICO-TROPICAL—LISBON).

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Written Examination.* Various locations in the United States and Canada, June 18. *Oral Examination.* San Francisco, Sept. 29-Oct. 3, and Phoenix, April 5-10, 1959. The 1959 written examination will be given in various locations in the United States and Canada, July 17. The final date for filing application for the 1959 written examination is six months prior to the examination. There is no filing deadline for oral examinations. Sec., Dr. Curtiss B. Hickcox, 217 Farmington Ave., Hartford 8, Conn.

American Board of Dermatology: *Written. Several Cities,* June 30. *Oral.* Detroit, Oct. 17-19. Final date for filing all applications is April 1. Sec., Dr. Beatrice Maher Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *Written.* Oct. 20, 1958. *Oral.* Philadelphia, April 23-26; San Francisco, June 18-21; Chicago, Oct. 13-16. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: Applications for certification, new and reopened, Part I, and requests for re-examination Part II, are now being accepted. All candidates are urged to make such application at the earliest possible date. Deadline date for receipt of application is September 1, 1958. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), January 1959. Final date for filing application is July 1, 1958. *Oral Examinations 1958* (Part II): San Francisco, June 17-21; Chicago, Oct. 17-22. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

American Board of Orthopaedic Surgery: *Part II.* Chicago, Jan. 21-23, 1959. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 6-10. Final date for filing application was April 30. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pathology: Chicago, Oct. 30-Nov. 1. Final date for filing application is Sept. 30. Sec., Dr. Edward B. Smith, Indiana University Medical Center, 1100 W. Michigan St., Indianapolis 7.

American Board of Pediatrics: *Oral.* Cincinnati, June 13-15; Chicago, Oct. 24-26 and New York, Dec. 5-7. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Physical Medicine and Rehabilitation: *Oral and Written.* Peoria, Ill., June 20-21. Final date for filing application was Feb. 1. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

American Board of Plastic Surgery: *Oral and Written.* Chicago, Oct. 9-11. Final date for receipt of case reports is July 1. Corresponding Secretary, Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

American Board of Proctology: *Oral and Written, Parts I and II.* September 1958. Final date for filing application is March 15. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Regular Examination in Radiology.* Washington, D. C., Dec. 8-12. Final date for filing application is July 1. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: *Oral (Part II).* Los Angeles, June 16-17; Portland, June 20-21. Written examinations (Part I) will be held at various centers in the United States, Canada, Hawaii, Puerto Rico, and certain military centers abroad on December 3. The date of the Fall examination in *Part I* has been changed from the last Wednesday of October as announced in its current Booklet of Information to December 3, 1958. Thereafter, examinations in Part I will be held once annually, on the first Wednesday of December. The closing date for filing applications will be August 1. *Part II.* Baltimore, March 10-11. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: The fall written examination will be given in September 1958 and closing date for registration is July 1. Registration for the fall oral examination closes July 1.

American Board of Urology: *Written Examination.* Twenty-five cities throughout the country, Dec. 5. The oral-clinical examination and the examination in Pathology will be given in Chicago in February 1959. Sec., Dr. William Niles, Wishard, Jr., 30 Westwood Road, Minneapolis 26.

Love, Jerome Sullivan, Hattiesburg, Miss.; Meharry Medical College, Nashville, Tenn., 1920; died Dec. 30, aged 68, of cerebral hemorrhage and hypertension.

McEachen, Esther Isabella ⊕ Modesto, Calif.; University of Nebraska College of Medicine, Omaha, 1927; member of the American Academy of General Practice; associated with Modesto State Hospital; died in San Francisco March 8, aged 65.

McGuigan, Henry Thomas, Red Wing, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; past-president and secretary-treasurer of the Southern Minnesota Medical Association; on the staffs of St. John's and City hospitals; died Feb. 26, aged 82, of uremia.

Matheson, John Hollis ⊕ Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1930; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; veteran of World War II; associated with Iowa Lutheran and Mercy hospitals, and the Iowa Methodist Hospital, where he died March 11, aged 53.

Matthews, Joseph Ira, Dallas, Ga.; Atlanta School of Medicine, 1911; formerly state legislator; died March 12, aged 71, of coronary thrombosis.

Messing, Arnold ⊕ Newburgh, N. Y.; Columbia University College of Physicians and Surgeons, New York City, 1916; fellow of the American College of Surgeons; veteran of World War I; past-president of the Orange County Medical Society; formerly practiced in New York City, where he was associated with Gouveneur and Mount Sinai hospitals; associated with St. Luke's Hospital in Newburgh and Cornwall (N. Y.) Hospital, where he died March 20, aged 66, of carcinoma of the colon.

Munch, Otto Louis ⊕ Pittsford, N. Y.; born in Omaha July 6, 1900; Creighton University School of Medicine, Omaha, 1927; president of the Wayne County Cancer Society; veteran of World War II; formerly on the faculty of the University of Rochester School of Medicine and Dentistry in Rochester, N. Y., where he was director of medical laboratories and chief pathologist at Genesee Hospital; at various times director of laboratories at the Veterans Administration Hospital in Bath, St. Jerome's Hospital in Batavia, and at Kenmore (N. Y.) Mercy Hospital; director of laboratories at Newark (N. Y.) State School, where he died at the hospital March 10, aged 57, of arteriosclerotic heart disease.

Nelson, Richard Marion ⊕ Atlanta, Ga.; Baltimore Medical College, 1903; died March 6, aged 76, of cardiac failure.

O'Brien, Joseph John, Glendale, Calif.; University of Southern California School of Medicine, Los Angeles, 1908; died March 8, aged 76.

Parkin, Victor ⊕ Los Angeles; Hahnemann Medical College of the Pacific, San Francisco, 1912; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; veteran of World War I; served as resident psychiatrist at the Los Angeles County General Hospital; formerly consultant in psychiatry at the Veterans Administration Hospital in Sawtelle, Calif., at Psychopathic Court, and at the Los Angeles County Juvenile Court; a member of the State Lunacy Commission; died March 19, aged 78.

Parmenter, Derric Choate ⊕ Tulsa, Okla.; Harvard Medical School, Boston, 1917; member of the American Public Health Association; formerly on the faculty of his alma mater; veteran of World War I; served as head of the Dyer County Health Department in Dyersburg, Tenn.; formerly in charge of public health work in Greenup County, Ky., and health officer of Breathitt County, Ky.; died March 11, aged 67, of cancer.

Rinkenberger, Fred W. ⊕ Los Angeles; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; fellow of the American College of Surgeons; on the staff of the California Hospital, where he died March 10, aged 79, of arteriosclerosis.

Schoolfield, Benjamin Lucky ⊕ Dallas, Texas; College of Physicians and Surgeons, Memphis, 1911; member of the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; veteran of World War I; on the staffs of the Methodist and St. Paul's hospitals; died in the Terrell (Texas) State Hospital March 6, aged 69, of acute hemorrhagic pancreatitis.

Serrill, William W., Endeavor, Pa.; University of the South Medical Department, Sewanee, Tenn., 1904; an associate member of the American Medical Association; for many years president of the Forest County National Bank of Tionesta; died March 19, aged 80, of coronary thrombosis.

Shugerman, Harry Philip ⊕ Birmingham, Ala.; Johns Hopkins University School of Medicine, Baltimore, 1908; veteran of World War I; died March 11, aged 76, of arteriosclerosis and cerebral thrombosis.

Spitaleri, Liborio Nicholas, Elizabeth, N. J.; *Regia Universitá degli Studi di Bologna. Facoltà di Medicina e Chirurgia,* Italy, 1940; an associate surgeon with the New Jersey Manufacturers Casualty Insurance Company in Newark; died in Newark March 19, aged 54, of coronary occlusion.

Startzman, Clyde Kress ⊕ Bellefontaine, Ohio; Indiana University School of Medicine, Indianapolis, 1915; member of the city-county health board, on which he served for many years; past-president and for many years member of the school board; veteran of World War I; on the staff of the Mary Rutan Hospital, where he died March 3, aged 67, of ruptured abdominal aneurysm.

Strauss, Edward Henry ⊕ Florence, Ore.; University of Texas School of Medicine, Galveston, 1940; died recently, aged 41, of pulmonary edema and cardiac dilatation.

Swertfeger, Herbert William ⊕ Virginia Beach, Va.; University of Virginia Department of Medicine, Charlottesville, 1933; associated with De Paul and Norfolk General hospitals in Norfolk; died March 11, aged 56, of coronary disease.

Thomas, Henry Bascom ⊕ Chicago; born in Elk Garden, Va., Aug. 15, 1875; Northwestern University Medical School, Chicago, 1903; professor of orthopedics emeritus at the University of Illinois College of Medicine; from 1903 to 1920 professor of hygiene and physical education and medical adviser, Armour Institute of Technology; at one time instructor of orthopedic surgery at his alma mater; specialist certified by the American Board of Orthopaedic Surgery; secretary of the Section on Orthopedic Surgery from 1917 to 1922 and chairman, 1923-1924, American Medical Association; member of the American Orthopaedic Association, Clinical Orthopaedic Society, of which he was past-president, and the American Academy of Orthopaedic Surgeons; past-president of the Chicago Orthopedic Society; veteran of World War I; associated with St. Luke's, Illinois Research, and Cook County hospitals, and Illinois Surgical Institute for Children and the Home for Destitute Crippled Children; died in the Presbyterian–St. Luke's Hospital March 25, aged 82, of carcinoma of the prostate.

Thomas, William McKinley, San Francisco; Meharry Medical College, Nashville, Tenn., 1930; veteran of World War II; on the staff of Mount Zion Hospital; died March 5, aged 54, of coronary thrombosis.

Tibbetts, Raymond Richard ⊕ Bethel, Maine; Medical School of Maine, Portland, 1901; president of the Bethel Library Association; trustee of the Gould Academy; veteran of World War I; associated with the St. Louis Hospital in Berlin and the Rumford (Maine) Community Hospital; died Feb. 27, aged 82, of cerebral hemorrhage.

Titus, Charles ⊕ Wilkinson, Ind.; Bellevue Hospital Medical College, New York City, 1894; member of the American Academy of General Practice; associated with the Hancock County Memorial Hospital in Greenfield; died March 11, aged 88, of cerebral thrombosis.

Watson, Frank Warner ⊕ Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1919; on the staff of the White Cross Hospital; died March 1, aged 63, of coronary disease.

Whalin, Marion Louise ⊕ Brookline, Mass.; Woman's Medical College of Pennsylvania, Philadelphia, 1935; certified by the National Board of Medical Examiners; died Feb. 27, aged 49.

White, Wendell, Los Angeles; Indiana University School of Medicine, Indianapolis, 1909; on the staff of Alvarado Hospital; died March 9, aged 77, of acute coronary occlusion.

Wilkins, Robert Weymouth ⊕ Fort Wayne, Ind.; University of Michigan Medical School, Ann Arbor, 1927; specialist certified by the American Board of Obstetrics and Gynecology; member of the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; veteran of World War II; on the staff of the Lutheran Hospital, where he died March 8, aged 56, of coronary thrombosis.

Woolhandler, Harry William ⊕ Pittsburgh; University of Buffalo School of Medicine, 1932; assistant professor of dermatology at University of Pittsburgh School of Medicine; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; past-president of the Pittsburgh Dermatological Society; veteran of World War II; a staff member of Montefiore and South Side hospitals; died March 11, aged 47, of acute ventricular fibrillation.

Yohannon, Joash Isaac ⊕ Lieut. Commander, U. S. Navy, retired, Eau Gallie, Fla.; Medical College of Virginia, Richmond, 1915; retired June 30, 1940; veteran of World Wars I and II; died in Jacksonville March 2, aged 72.

Young, Anthony Obediah, Butler, Ill.; Beaumont Hospital Medical College, St. Louis; 1893; formerly practiced in St. Louis, where he was associated with Missouri Baptist Hospital; died Feb. 22, aged 89.

Young, Clifton Aurelius Jr., Dunedin, Fla.; University of Tennessee College of Medicine, Memphis, 1956; interned at City of Memphis Hospitals in Memphis, Tenn.; died in the North Mississippi Hospital in Holly Springs, Miss., Dec. 1, aged 23, of anaphylactic shock following injection of tetanus antitoxin given for a minor laceration of nose due to an automobile accident.

FOREIGN LETTERS

BRAZIL

Polyposis.—Dr. Silvio Levy (*Revista do Hospital Matararazzo, São Paulo*) cites as evidence to show that polyps of the colon or rectum are premalignant lesions (1) the fact that both polyps and carcinomas are located in the various segments of the large intestine in almost equal percentage; (2) the parallelism between the incidence of carcinomas and polyps of the large intestine in adults, in different ages and sexes; (3) the frequency with which polyps are associated with rectocolic carcinoma; (4) the transformation of nontreated polyps into carcinoma; (5) the presence of adenomatous remaining tissue in many rectocolic carcinomas, even in a late stage; (6) the high incidence of malignant degeneration in multiple polyposis; and (7) the high incidence of carcinomatous structure in many rectocolic adenomas. Differences persist as to the criteria to be adopted by the pathologists concerning the diagnosis of malignancy in adenomas. Many do not recognize the existence of malignancy unless there is a definite invasion of the tissue by neoplastic epithelial elements. They thus reject the concept of the confinement of malignant cells (carcinoma in situ). The greatest incidence of polyps has been found in the age group 40 to 80, men being more subject to them than women and white people more than nonwhite. In the author's series of 67 patients with polyps, 18 had carcinoma. Some of these were under 10 years of age.

The author advocates (1) sigmoidoscopy in every patient examined for the first time, regardless of his age; (2) annual sigmoidoscopy in every patient over 40; (3) annual sigmoidoscopy and barium enema in all patients with a familial history or with a previous polyp; and (4) sigmoidoscopy with barium enema in all patients with rectal symptoms; this procedure should be repeated after six months if the first examination gives negative findings.

CANADA

Supplemental Oxygen for the Newborn.—Because the newborn premature infant in respiratory distress is menaced on the one hand by the danger of damage to vital centers due to hypoxia and on the other by retrolental fibroplasia, Swyer and Wright (*Canad. M. A. J.* 78:231, 1958) controlled the oxygen supply by a diamagnetic oxygen analyzer and an ear oximeter. They found that these instruments could be satisfactorily used to control the administration of supplemental oxygen at the minimum level necessary to secure physiological oxygenation of arterial blood in the newborn. By means of these instruments arterial oxygen saturation can be correctly assessed. The clinical assessment of hypoxia is unreliable. In their series of 31 infants they thought that 15 had probably received oxygen unnecessarily though not in harmful amounts. Of those who required oxygen, 10 needed a concentration of above 35% initially. The required level for normal arterial oxygen saturation drops progressively over about five days to the atmospheric level of 20.9% in most cases.

Incidence of Emotional Disease.—It is difficult to obtain a true estimate of the incidence of emotional disease in a population. Harding le Riche (*Canad. Psychiat. A. J.* 3:23, 1958) attempted to make such an estimate among the population of a prepaid medical care plan in Ontario from a sampling of those with psychiatric diagnoses. Of each 1,000 participants there were 33 with a definite psychiatric diagnosis, and these required a total of 120 services for 36 episodes. The commonest diagnosis was of anxiety reaction without somatic symptoms, followed by nervousness and debility, psychoneurotic disorders, psychoneurosis with somatic symptoms affecting the digestive system, primary childhood behavior disorders, psychoneurosis with symptoms affecting the circulation, and neurotic depressive reaction. The major psychoses were uncommon in this prepaid medical care group, which was relatively favored, having an excess of young working adults and children. About 2.35% of the total expenditure of the plan for medical care was paid out for psychiatric conditions. When a broader classification was taken, including illnesses possibly or probably psychosomatic, such as migraine, peptic ulcer, pruritus, and hypertension the total expenditure was 14% of the total cost to the plan.

Alcoholism in Rats.—It has been suggested in the past that in a colony of rats, given a choice of water and alcohol, some rats will choose the former and some the latter. It has further been suggested that this choice is genetically determined. This would be an acceptable hypothesis to many alcoholics, who might plead a genetic predisposition to alcoholism. Two observers from the Banting and Best Department of Medical Research, Toronto (*Canad. J. Biochem. and Physiol.* 36:37, 1958) conducted some experiments on adult male rats fed an ade-

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The items in these letters are contributed by regular correspondents in the various foreign countries.

quate diet, which cast doubt on the genetic theory. An early impression had been that a number of the rats preferred 15% alcohol to water, but this was found to be incorrect. The reason for their preference lay in the placing of the drinking fountains. A careful study of the records of experiments with certain individual rats showed that several of the "alcoholic" rats had suddenly become "teetotallers" and that some of the others had begun to drink large amounts of alcohol. When the observers became aware of the importance to some rats of the location of the fountains and deliberately varied this, the relative consumption of the two liquids changed. It was conjectured that some animals were right-pawed and others left-pawed and that the arrangement of the fountains affected the ease with which the rat could open the lid to get a drink.

Costs of a Prepaid Medical Care Plan.—Administrators of prepaid medical care plans are interested in knowing certain facts about those of their subscribers who cost an exceptionally large sum of money during the year. A study on these lines of a sample of 3,000 subscribers to a comprehensive medical, surgical, and obstetrical plan was made in Ontario ("A Special Study of High and Low Cost Groups in a Canadian Prepaid Medical Care Plan" by the Research and Statistics Department of Physicians' Services Incorporated). The sample was divided arbitrarily into two groups, a high-cost group, containing all those persons who cost the plan $60 or more in the year under review, and a low-cost group comprised of the rest. The high-cost group contained only 611 persons (13.5% of those ill in the sample), or 8% of all participants. This 8% cost the plan over 50% of all funds expended on the sample. The list of costly conditions, arranged in order of magnitude, was headed by diseases of the digestive system, followed by deliveries, complications of childbirth and the puerperium, diseases of the genitourinary system, and diseases of the circulatory system. When a profile of the high-cost group was constructed, it was found to contain an excessive number of young adults between 20 and 45 years of age. There were not as many persons of 50 years and over in the high-cost group as might be expected. The age group 20 to 45 included women in the childbearing period and also those requiring the greatest number of gynecologic operations.

The expensive young adults had a high incidence of appendicitis and hernia repair. Medical treatment for peptic ulcer was a costly item. Diseases of the nervous system and major ocular operations were expensive, especially for older people, and otitis media remained a costly item for the younger group. As regards the circulatory system, hemorrhoids and other varicose veins and degenerative cardiovascular diseases were expensive. In the high-cost group there was also a large proportion of fractures and other accidents. Various rheumatic conditions, psychoneuroses, diabetes, thyroid disease, asthma, and obesity were all represented in the high-cost group, and upper respiratory diseases were commoner in this group than in the low-cost group. Although tonsillectomy and circumcision rates were high in the high-cost group, each of these operations cost relatively little. It was the bulk of them that imposed a burden. The 10 leading categories in the high-cost group were diseases of the respiratory system; genitourinary system; digestive system; delivery, childbirth, and puerperium; circulatory system; nervous system; accidents; "symptoms"; senility; and locomotor system, skin, and cellular tissue. In addition, the high-cost group required more services (physicians in this plan are paid on a fee-for-service basis) per disease episode. Acute respiratory illness still presents a great challenge to both curative and preventive medicine. Even in these days of reasonably accurate diagnosis, vague symptoms came eighth on the list of frequency in the high-cost group and seventh in the low-cost group. Other vague diagnoses were dermatitis and anemia of unspecified type.

Alcoholism.—The seventh annual report of the Alcoholism Research Foundation of Ontario makes depressing reading, for the foundation now estimates that Ontario has a total of 76,000 alcoholics and that since World War II alcoholism has been increasing at an average rate in excess of 4,000 cases a year. The foundation, operating in four Ontario cities, treated only 1,666 patients last year, and even though many other institutions and organizations gave treatment to alcoholics, the facilities were far from meeting the needs. Alcoholism represents the largest public health problem facing this generation, and there is a pressing need for great increases in the number of physicians and others who can and will treat this disease. The foundation sees much hope for the future in the recognition of alcoholism as a health problem and not a disciplinary problem by employers. Their industrial health programs are being revised to include treatment for alcoholic employees. From 3 to 6% of the employees in industries that the foundation studied have problems with alcohol, and these employees average 15.5 days of absenteeism per year, or about 10 days over the normal rate. The foundation has been rapidly developing the educational side of its work, but it still spends a large proportion of its money on research.

Financing Health Insurance.—One of the problems disturbing the economists is the amount of money a nation can spend on financing health insurance without impairing its economy in other directions. Last year a monograph entitled "Underwriting Canadian Health" was issued jointly by the Canadian Chamber of Commerce and the Canadian Life Insurance Officers Association. Projecting costs for health insurance forward to 1980, the report suggested that a government-sponsored universal medical insurance plan would not be feasible. More recently, Malcolm Taylor, a political economist, criticized some of its findings. He said "If we cannot afford to pay for hospital care through a government program, neither can we afford to pay for it by any other means." The only reason that a government hospital care plan would increase the cost of hospitalizing patients over and above the normal rate of increase would be that certain people not previously insured were receiving care they should have had right along.

The example of rising hospital costs in Saskatchewan, which has a universal hospital plan, is considered not to apply to the rest of Canada, for Saskatchewan has used its hospitals as a means of getting medical care to the rural patients who make up the great bulk of the population and who in an urban center would have been treated at home. Dr. Taylor also asks why, if the economy is being strained, it is the health expenditures that cause concern and not the expenditures on luxuries. He believes that, instead of the bankruptcy predicted by the report, rising standards of health services in a health insurance scheme will be part of a rising standard of living. He also believes that government will only act as a channel for part of an insurance program and that there should be a rapid expansion of voluntary prepayment and commercial insurance on a bolder scale. In any case, only a part of the job of providing hospital services is going to be channeled through government under the new scheme, namely the payment of operating costs. Provision of facilities will remain a voluntary, private, and local responsibility.

INDIA

Nephrotic Syndrome in Children.—L. S. Prasad (*Indian J. Child Health*, vol. 7, March, 1958) stated that many views have been advanced regarding the cause of the nephrotic syndrome. The authors studied the clinical features in cases which fulfilled the terms of definition of this syndrome, namely, those showing marked edema, albuminuria, hypoproteinemia, hypercholesterolemia with or without hypertension, hematuria, and impaired renal function. In their series of 20 cases the ages of the patients varied between 1 and 11 years. A history of upper respiratory infection preceding the disease was obtained in only four cases. One patient had a history of frank hematuria, three had an acute onset, and the onset was insidious in the rest. The commonest symptoms were edema and oliguria. Two had a pulse rate above 120 per minute. There was no significant rise in blood pressure. One patient had enlarged cervical lymph nodes. The edema was slight in three, moderate in 11, and massive in 6. The liver was palpable in 12 and the spleen in 1. Two patients showed slight ascites, while it was moderate in 7 and massive in 11. Rhonchi in the chest were heard in five and eight developed intercurrent infections and fever with deterioration in the general condition and a decrease in urinary output.

In one patient spontaneous diuresis occurred, with pyrexia of unknown cause. One patient developed hypocalcemic tetany probably due to the alkalosis from prolonged administration of alkalies. Frequent attacks of diarrhea occurred during treatment with alkalies, and they responded better if alkalies were withdrawn. Four patients had Escherichia coli in the urine culture. The Wassermann reaction was positive in two. All but two had severe albuminuria, and erythrocytes were present in the urine in all but one. All but two had granular casts. The blood urea level was raised and ranged from 25 to 100 mg. per 100 cc., while the blood cholesterol varied between 188 and 470 mg. per 100 cc. The total plasma protein levels were lowered in all but three. The author concluded that the so-called nephrotic syndrome may be a form of nephritis but still a clinical entity, there being no history of acute nephritis in most cases. If followed up for years most patients would be found to develop chronic nephritis.

Infantile Diarrhea.—Basu and Rao (*Indian J. Child Health*, vol. 7, March, 1958) studied 100 patients with infantile diarrhea to determine the relative values of sulfaguanidine; Chlorostrep (equal parts of chloramphenicol and dihydrostreptomycin); oxytetracycline; a combination of sulfadiazine, phthalylsulfathiazole, and chloramphenicol (chloramphenicol-sulfa); and pectin and kaolin compound. Of the children in the series 80% were below one year of age. Most were admitted with diarrhea of two to four days' duration. The condition was classified as slight in 24, moderate in 56, and severe in 20; 39 were treated with sulfaguanidine, 21 with Chlorostrep, 18 with chloramphenicol-sulfa, and 11 each with oxytetracycline and the pectin and kaolin compound. The progress was judged by the number of stools per day, their character, urinary output, vomiting, general condition, and the number of days of hospitalization required. Chlorostrep was more effective than any of the other drugs. Patients given this drug who were slightly or moderately ill required about six and eight days respectively in hospital. The results with oxytetracycline were not encouraging, and those with chloramphenicol-sulfa were no better than those with Chlorostrep. There were 20 patients whose disease was severe, and of these 12 died; but none of the 6 treated with Chlorostrep died. Ten patients were treated with sulfaguanidine, and of these 3 died; and 2 received chloramphenicol-sulfa, and of these one died. The effect of oxytetracycline and the pectin and kaolin compound could not be studied adequately in patients with severe diarrhea, as the only patient in each of these categories died. Correction of fluid and electrolyte balance is an important part of the treatment of this condition. When facilities for identification of the responsible pathogens are available, chemotherapy may wait for the identification, but if they are not readily available, Chlorostrep should be given by mouth.

Vitiligo.—Chaudhari and Chakraborty (*J. Indian M. A.*, vol. 30, March 1, 1958) stated that the main ultimate factor causing vitiligo is probably the failure of the intracellular metabolic processes concerned with the conversion of tyrosine to melanin, the reason for which is still obscure. The tyrosinase activity of the melanocytes is believed to be absent in this disease. The authors took biopsy specimens from marginal areas so that the same specimen showed diseased and normal tissue. Of the 10 patients thus studied, 4 had received previous treatment without benefit. A deficiency of tyrosine was found in the vitiligenous skin. Here the basal cells of the epidermis contained less ribonucleic acid as compared with normal skin. Most of the nuclei of basal cells and prickle cells of the affected area were larger in size than normal. The nucleoli were more fragmented and showed a relatively weaker reaction for desoxyribose nucleic acid, but the reaction for hyaluronic acid and for alkaline phosphatase was relatively stronger.

Anemias in Childhood.—O. P. Ghai (*Indian J. Child Health*, vol. 7, February, 1958) studied 52 cases of anemias in children below the age of 3 years. The mothers of 32 were undernourished and anemic. The diet was universally inadequate in both breast-fed and artificially fed children. Mixed feeding was started late and was of poor quality. Eight patients showed evidence of clinically detectable nutritional deficiency. Plasma proteins were below normal in 26. Infections (mainly gastrointestinal and respiratory) were present in 45. Eight had a positive tuberculin reaction, and 7 of these had radiologic evidence of tuberculosis. Two had ankylostomiasis. In 18 the hemoglobin was 5 Gm. per 100 cc. or less on admission and in 29 it was between 5.1 and 9.5 Gm. per 100 cc. Excluding the five patients with congenital hemolytic anemia, the type of anemia was normocytic normochromic in 19.15%, normocytic hypochromic in 34%, microcytic normochromic in 6.4%, microcytic hypochromic in 21.3%, macrocytic normochromic in 14.9%, and macrocytic hypochromic in 4.25%. Malnutrition and infections were the chief etiological factors. Hemolytic anemia was present in 21.16% of these patients, 9.62% of whom had congenital hemolytic anemia. Erythroblastosis due to Rh incompatibility was rare in this series. The cause of hemolysis in the rest of the patients with hemolytic anemia could not be determined. Acute acquired hemolytic anemia was the most likely diagnosis in some of these.

Chloramphenicol in Typhoid.—Kamat and Damany (*J. Indian M. A.*, vol. 30, March 1, 1958) treated 87 patients with typhoid. All but four were given chloramphenicol every 12 hours. Of the four not so treated two left soon after admission against medical advice, one died before treatment could be started, and one made a prompt recovery without the drug. Chloramphenicol was given initially in doses of 0.75 Gm. twice a day. The dose was reduced to 0.5 Gm. twice a day when the patient's temperature fell to between 99 and 100 F (37.2 and 37.8 C) and was further reduced to 0.25 Gm. twice a day when his temperature became normal. This dose was continued for four to six days. Patients with a low temperature range such as those with relapses, or those who had received inadequate antibiotic treatment prior to admission, and those with paratyphoid; and all children below the age of 10 years were given 0.5 Gm. twice daily as the initial dose. When oral administration was not possible as in patients with severe toxic conditions and those with complications, intramuscular injections of 0.5 Gm. were given. Most of the patients were in the age group 11 to 20, the youngest being 4 and the oldest 49. The average duration of fever before admission was 22 days. It was continuous in 74, intermittent in 7, and was classed as relapse in 6. Eight gave a history of rigors in the beginning.

The commonest of the accompanying symptoms was an unproductive cough, present in 34. Mild toxemia was present in 30, moderate toxemia in 21, and severe in 3. Bronchitis was present in 42. Marked anemia was found in 19; leukopenia in 66; and leukocytosis in 20. The blood count was normal in the rest. Relative lymphocytosis was present in 77. The Widal reaction was performed in 77. In 63 of these it was positive, and 13 patients were found to have paratyphoid A. Of 29 blood cultures 22 were positive for Salmonella typhi. Severe diarrhea in three patients was relieved by supportive treatment and dietetic restrictions. In one patient an intractable diarrhea was checked by giving chloramphenicol. Treatment with other antibiotics prior to admission had failed. Four patients, one of whom died, had a gastrointestinal hemorrhage. Perforation occurred in two patients, one of whom died. Encephalitis developed in two patients, one of whom died. One patient developed pneumonia and bursitis, a rare complication, after the temperature had returned to normal. Toxic myocarditis and auricular fibrillation developed in one. Of the 87 patients, 7 (all adults) died. The temperature returned to normal in three to six days in most patients. Relapses occurred in seven patients who were treated with chloramphenicol and who responded promptly. No toxic effects due to the drug were noticed. Blood counts made on discharge in the 19 patients with anemia showed no evidence of aplastic anemia.

Treatment of Tuberculosis.—S. C. Lahiri and co-workers (*J. Indian M. Profession*, vol. 4, March, 1958) used a salt obtained by treating isoniazid with aminosalicylic acid to treat nine patients who had tuberculosis. Two of the patients had miliary tuberculosis, two glandular, three intestinal, and two had polyserositis. The salt was given in doses of 200 mg. three times a day. The duration of treatment varied from 30 to 45 days. Of the two patients with miliary tuberculosis one was also given 10 Gm. of streptomycin daily and showed marked improvement both clinically and radiologically. The other (farther advanced) died. All other patients showed moderate to marked improvement, especially those with glandular tuberculosis, in whom the results were excellent. In all patients the temperature was controlled except in the patient who died and another who required 30 Gm. of streptomycin to control the temperature after the isoniazid salt failed to do so within 15 days. Toxic reactions were practically absent except for a slight gastrointestinal upset in one and headache and palpitation in another.

NEW ZEALAND

Accident Rate.—About 11.5% of all beds in general hospitals are occupied by accident victims and the running costs of maintaining these beds exclusive of capital costs is about $4,500,000 a year. There were 45,000 accidents, 97 of them fatal, in industry during 1957. This showed a marked improvement on the figures for 1956. Industrial accidents cost this country about 30 million dollars a year, and in 1955, the last year for which detailed statistics are available, the time lost through 42,038 accidents was 832,000 days. It is estimated that nearly 1 million days were lost from work last year. Traffic accidents in 1957 totalled 7,938 compared with 7,042 in 1956. There were 383 traffic deaths last year. In 1957, 44 agricultural employees died in accidents. Of these, tractors were involved in 33. No fewer than 23 children were accidentally killed on farms last year. A "Safety Week" exhibition in Wellington stressed the need for greater safety consciousness.

Hypogonadism Preceding Pituitary Tumors.—Starting from the facts that in rodents partial or complete impairment of thyroid and also of gonadal function leads in time to the development of pituitary tumors and that there is some scattered evidence of pituitary tumor formation in man following prolonged thyroid deficiency, Prof. J. E. Caughey (*Australian Annals Medicine*, vol. 6, p. 93, 1957) attempted to correlate hypothyroidism or hypogonadism with the development of pituitary tumors in man. Some of Cushing's classical case records and the records of 50 patients studied in the Dunedin Hospital were scrutinized. In many of these the documentation was inadequate. No case was found in which hypothyroidism appeared to be the forerunner of a pituitary adenoma. The search for evidence of hypogonadism preceding the development of pituitary tumors proved to be more rewarding. Cushing cited two cases, and four of the author's cases supported such a suggestion. Two of the author's cases were women in whom bilateral oophorectomy was followed 24 and 23 years later by the development of pituitary tumors. In two men relative hypogonadism preceded the development of pituitary tumors. Although the search for cases of pituitary tumors that might have been preceded by a state of hypothyroidism proved to be fruitless, this is not surprising as the hypothyroid syndrome is now usually recognized and treatment is instituted early. In rats and mice tumors can be prevented by giving thyroid hormone. Thus in recent years severe untreated myxedema of prolonged duration is rare. In rats and mice surgical ablation of the gonads leads in time to the development of basophilic adenomas of the pituitary. In the two human cases cited by Cushing the clinical evidence suggests a degree of hypogonadism, which may be attributed to the cystic state of the ovaries in both patients.

In all of Professor Caughey's patients there was evidence of hypogonadism. In men with pituitary tumor of the chromophobic type there is often evidence of defective secondary sexual hair growth for many years before the patient presents symptoms and signs of a pituitary tumor. This suggests a prolonged period of defective androgenic function preceding the development of the tumor. In three of the author's patients the tumor was clearly chromophobic, whereas the reports on rats and mice were of basophilic tumors. This has to be viewed in the light of modern cytological study of the pituitary. The chromophobic cell is an inactive cell and may represent a quiescent phase of an acidophilic cell. With modern staining methods, chromophobic cells are often found in patients with clearly defined acromegaly. This suggests that the acidophilic cell may be transformed to a chromophobic cell. In all six cases reported there was evidence of complete or partial failure of the gonads. Drawing on the analogy with the animal experiments, it seems possible that the development of the pituitary tumors was due to an overactivity of gonadotropic cells with subsequent tumor formation.

Alcoholism.—In a circular letter sent to all medical practitioners, the Department of Health stresses that the maximum age incidence of alcoholism is between 35 and 55. Men predominate. Alcoholics tend to show better than average efficiency in whatever job they have chosen, and a significant proportion come from the managerial and administrative ranks. Early signs include (1) the necessity to sneak extra drinks; (2) the necessity to drink before starting the day; (3) the inability to stop short of drunkenness; (4) the development of "black-outs," i. e., periods of amnesia either after a drinking spree or independently; (5) increase in absenteeism from work; (6) a liability to carelessness and accidents on the job; (7) such changes in personality as carelessness in dress, moodiness, and unpredictable behavior; (8) disregard of personal, family, and work obligations, and of social and moral standards generally; and (9) increasingly transparent excuses for failure. In many cases the alcoholic will minimize, or even deny, his drinking problem when he first consults a physician. Advice must be offered in a friendly and uncritical fashion initially. The alcoholic is almost invariably a rather insecure and touchy person and direct reproach or disciplinary measures are almost certain to intensify the problem. The emphasis should be on the medical aspect and the possibility of treatment.

Poliomyelitis Vaccine.—The Department of Health last year received monthly supplies of poliomyelitis vaccine from Australia which were used to vaccinate children and pregnant women. Under this year's scheme, children from 2 to 16 will be vaccinated. The first two injections are given 4 weeks apart and the booster some time between 6 and 12 months later. Many children who were injected on the first two occasions with British vaccine will get a booster of Australian vaccine.

Vascular Pattern of Regenerated Tendons.—Although it has been stated that the structure of regenerated tendon ultimately becomes normal, Dr. N. W. Nisbet (*Proceedings University of Otago Medical School*, vol. 35, p. 26, 1957) reported that neither the microscopic structure nor the intratendinous vascular pattern of the tenotomized tendo Achillis of laboratory animals did so even after nearly a year. Subcutaneous and open tenotomies of the tendo Achillis of the rabbit, guinea pig, and rat were performed. Only the rabbits' legs were immobilized in plaster for three weeks. The animals were killed at intervals ranging from a few days to nearly a year after tenotomy. In the early stages of regeneration the vessels from the surrounding tissues invaded the forming tendon. Ultimately, in a tendon which functioned adequately, they consisted of a series of coarse looped vessels reaching the surface of the tendon from the surrounding tissues. This pattern in no way resembled the delicate vascular grid formed by the capillaries related to the tendon fasciculi in the normal state. The venous pattern of regenerated tendon was likewise irregular. These new intratendinous vessels ultimately anastomosed with the intratendinous vessels of the tendon ends. These vascular arrangements of regenerated tendon were consistent with the other histological findings. Even after nearly a year the structure of the tendon fasciculi remained coarse and irregular, and the appearance did not suggest that it would ultimately return to normal, despite adequate function. Dr. Nisbet concluded that regenerated tendons do not acquire a normal cellular and vascular structure.

UNITED KINGDOM

Hypnosis in Plastic Surgery.—A recurrent problem in plastic surgery is the maintenance in apposition of two widely separated areas while tissue is being transferred from one to the other. The use of plaster of paris is uncomfortable, causes sores, immobilizes joints, and produces stiffness that may require weeks of physiotherapy for its relief. Bearing in mind that some subjects under hypnosis can be placed in bizarre postures and fixed there until the suggestion is given for release, Kelsey and Barron (*Brit. M. J.* 1:756, 1958) considered the possibility of securing fixation by this means. A patient of 24 was selected for the test. He had extensive tissue loss from the fore part of the right foot, which was to be repaired with a pedicle from the abdomen transported via the left forearm. As a preliminary measure, the patient was put under complete hypnosis, and the left arm was fixed against the abdomen in the position it would occupy during and after the operation. Under hypnosis the patient was instructed to lock the arm in this position. This was done so effectively that it could not be moved voluntarily, nor could it be moved by attendants until unlocked by hypnosis later. After several trial runs of hypnosis, the operation of freeing a pedicle from the abdomen and inserting it into the wrist was performed with the patient under local analgesia. The patient was hypnotized after optimal positioning of the forearm and wrist at the end of the operation and ordered to lock the arm in this position. He was then brought out of hypnosis. The position was maintained accurately until released by hypnosis at the next operation three weeks later, when the lower end of the pedicle was freed from the abdomen and inserted into the forearm. It was observed with astonishment that from the moment of release movement of the elbow and shoulder joints was full, free, and painless.

A similar procedure was adopted for the transfer of the pedicle from the wrist to the fore part of the foot. After a trial run of hypnosis the operation was performed with the patient under local analgesia, with his arm and wrist placed in the optimal position and locked there under hypnosis. This position was maintained for 28 days, during which the patient slept sitting up. At the end of this time the arm was unlocked under hypnotism. Immediately after unlocking the movements of all the joints, including those of the spine and fingers, were full, free, and painless. Kelsey and Barron suggest that this hypnotic method of fixation be used when possible, and that physiotherapists and selected nurses might be trained in hypnotism for this purpose.

Prostatitis and Ankylosing Spondylitis.—Mason and co-workers (*Brit. M. J.* 1:748, 1958) investigated the incidence of prostatitis in men with ankylosing spondylitis. A possible association was suggested by the occurrence of prostatitis in patients with Reiter's syndrome and the frequent presence of genital infection in patients with ankylosing spondylitis. The authors studied 54 men with the latter and compared them with 86 who had rheumatoid arthritis and 59 who had Reiter's syndrome. Prostatic fluid was obtained by massage and examined by dark-field microscopy for clumps of polymorphonuclear leukocytes. The diagnosis of chronic prostatovesiculitis was made on finding clumps of pus cells containing a minimum of 10 cells per high-power field. A high incidence of prostatitis (83%) was found in the patients with ankylosing spondylitis, compared with a much lower incidence (33%) in those with rheumatoid arthritis. As would be expected nearly all patients with Reiter's syndrome had prostatitis. Whether the coexistence of ankylosing spondylitis and prostatitis is an associated phenomenon or whether the conditions are etiologically related is not clear. Until the organism responsible for nonspecific urethritis is identified, cause and effect cannot be distinguished, and at present no more than an association between the two conditions can be established.

Mitral Valvotomy and Pregnancy.—Pregnancy in patients with severe mitral stenosis still remains hazardous, mainly because of pulmonary edema. The surgical relief of the stenosis offers a new approach, but the place of valvotomy has been the subject of controversy. Wade and co-workers (*Lancet* 1:559, 1958) assessed the results of initial valvotomy in pregnancy from their series of 27 patients and an examination of the recent literature, covering 77 others. The operative mortality in the 104 patients was 2.2% and the abortion rate 5.6%. They concluded that pregnancy does not increase the operative risk, which approximates closely the anticipated mortality in patients in groups 2 and 3 of the American Heart Association's classification. The maternal mortality is probably increased by valvotomy during pregnancy in contrast to medical management, but this increased risk is no more than that which would be incurred if the pregnancy were allowed to continue without operation and valvotomy were performed post partum. Compared with medical management the operation does not increase the fetal mortality. This was 5.6% in the patients operated on and 10.2% in a series of 990 pregnancies complicating all forms of heart disease. Of these 6.4% were terminated because of the heart disease. The results compared favorably with the anticipated abortion rate of 2% from the 12th week onwards in healthy women. The authors concluded that if during pregnancy the symptoms are severe enough to warrant it and if valvotomy is technically feasible, it is the treatment of choice.

Seventeen pregnancies in 16 patients who had previously undergone mitral valvotomy were followed: 12 living children were delivered normally at full term; one pregnancy was terminated because of heart failure; one patient was delivered by cesarean section at 38 weeks because of toxemia; and there were two fetal deaths unrelated to the mothers' heart condition. Symptoms due to severe pulmonary congestion were encountered in 3 of 10 patients placed in group 1 after the operation and 5 of 6 patients in group 2. The authors concluded that although pregnancy following successful valvotomy is usually safe, difficulties may be encountered, and that a technically unsatisfactory operation, even if followed by reasonable functional improvement, is unlikely to permit pregnancy to take a normal course. The assessment of fitness for pregnancy cannot be satisfactorily undertaken in less than six months after the operation.

Mass Radiography Campaign.—In Edinburgh 190,000 persons participated in the city's mass radiography scheme. Of these 6,600 were recalled for a larger film, and of these 1,650 were referred to a chest clinic for further investigation; 44 had active pulmonary tuberculosis requiring treatment, and of this number 20 were hospitalized. The figures indicate that about 1 in every 4,320 persons examined by mass radiography in Edinburgh required active treatment for pulmonary tuberculosis.

Smoking and Peptic Ulcer.—Doll and co-workers (*Lancet* 1:657, 1958) investigated the smoking habits of patients with peptic ulcer and compared them with those of a control group of patients with diseases believed to be unrelated to smoking. Each ulcer patient was matched by two control subjects for sex, age, place of residence, and in the case of men for socioeconomic class. Data were finally obtained from 327 patients with gastric ulcer, 338 with duodenal ulcer, and 1,143 controls. The proportion of nonsmokers was less in both sexes among the ulcer patients than among the controls. In contrast no appreciable differences were found between the proportions of heavy smokers. More of the male gastric ulcer patients than of their controls had started to smoke before the age of 15, and fewer had begun to smoke at the age of 30 or more. The proportion of those who smoked only cigarettes was higher in patients with peptic ulcer than in the controls. The authors pointed out that these data could be interpreted in various ways: The presence of an ulcer might stimulate a desire to smoke; some psychological factor might predispose to smoking and to peptic ulcers; or smoking might be the primary factor and might contribute directly to the production or maintenance of an ulcer in some patients.

Because more than one explanation is possible further evidence was obtained by a clinical trial. Inpatients with gastric ulcers who were regular smokers were divided into two groups on admission. One group was advised to stop smoking, and the other was not. Both groups were given the same medication and treated by bed rest for four weeks. The size of the ulcer was reduced by two-thirds or more in 75% of patients advised to give up smoking, the average reduction being 78%. Among the 40 patients in the group not advised to give up smoking the size of the ulcer was reduced by two-thirds or more in 58%, with an average reduction of 56.6%. The average reduction in size of the ulcer was greater in those patients following the advice not to smoke at all than in those who reduced the amount of smoking but did not stop. The average gain in weight was not significantly different in the smoking and nonsmoking groups. It was concluded that in some patients smoking interferes with the healing of a peptic ulcer and helps to maintain its chronicity.

Prophylaxis and Treatment of the Common Cold.—Skeptical of the value of autogenous vaccines in the prophylaxis of the common cold, but acceding to requests for them from chronic sufferers who maintained that they were of value, Dr. J. Ritchie (*Lancet* 1:615, 1958) carried out a controlled clinical trial among 200 volunteers, of whom 120 received an autogenous vaccine and 80 carbolized saline solution as a control. To exclude the possibility of bias information was sought on age, sex, years of service, association with children, and smoking habits. The only one of these that showed an appreciable difference in distribution between the vaccinated and control groups was the proportion of smokers. Smokers and nonsmokers were equally distributed in the vaccine-treated group, while in the control group nonsmokers outnumbered smokers almost two to one. The organisms found on culture of nose and throat swabs were mainly Streptococcus viridans and Neisseria catarrhalis, with a few staphylococci and some diphtheroids. The vaccines were made to a strength of 500 million organisms per milliliter, and injections were given once a week for eight weeks. The first injection was 0.1 ml., the second 0.3 ml., and the third and subsequent injections were 0.5 ml. Colds were classified as full or unmodified, mild, and prodromal. Of the volunteers, 184 completed the course of injections, 109 in the treated and 75 in the control group. The incidence of colds per month during the injection period was five times as great in the control group as in those vaccinated. Time lost from work through colds and upper respiratory infection was also greater in the controls. The percentage of colds passing from the prodromal to the fully developed stage was 13 in the treated group and 62 in the controls.

Ritchie made a further trial of the effectiveness of the broad-spectrum antibiotics in reducing the duration of the common cold. This was done on the assumption that most of the secondary symptoms are due to enhanced virulence of the patient's normal nasal and pharyngeal flora following depression of the body's resistance by the common cold virus. Sensitivity tests were done on the bacterial flora of the saliva. At the onset of prodromal symptoms each volunteer was given either a placebo tablet of lactose, if in the control group, or, if in the treated group, a 15-mg. tablet of tetracycline, oxytetracycline, or chlortetracycline. The antibiotic was chosen according to the saliva sensitivity tests. From October to April, 581 volunteers received short-term antibiotic treatment of two tablets a day for three days. The 338 controls were given inert tablets in the same dosage. In the treatment group the number of patients in the prodromal stage reported was 287 (49%) of which 22 (7%) went on to full colds. In the control group the patients in the prodromal stage numbered 182 (54%), of which 87 (48%) went on to full colds. These figures corresponded to 4 colds per 100 in the treated and 26 per 100 in the untreated subjects. Ritchie considered short-term antibiotic treatment justified to cut down the effects of the common cold, particularly in industry. The small dosage given had no permanent effect on the sensitivity of the pharyngeal bacteria nor on the proportions of the various species.

Food Poisoning from Potatoes.—Although potatoes have rarely been found to be a cause of food poisoning, Davies and Parry (*Lancet* 1:684, 1958) traced an outbreak of staphylococcic food poisoning to potatoes infected after cooking. Eight persons developed acute diarrhea and abdominal pains with vomiting one-half hour to four and one-half hours after a meal in a restaurant. Staphylococcus pyogenes var. aureus was found in the feces and vomitus, a finding which, coupled with the short incubation period, established the diagnosis. The only food eaten by all the victims was French-fried potatoes. Eleven of those handling the food in the restaurant were found to be carrying staphylococci in the throat, nose, intestines, or hands. The organisms were recovered from the hands, chin, and feces of one of the cooks. Although no infected potatoes were found, it was ascertained that they were prepared by the infected cook. Tests showed that although cooking potatoes destroys any contaminating staphylococci, they may readily become infected afterwards. Another possibility was that heat-stable Staphylococcus enterotoxin formed in infected potatoes during their preparation.

CORRESPONDENCE

BCG VACCINATION

To the Editor:—The recent report of the Ad Hoc Committee of the Surgeon General of the United States, after weighing the advantages and disadvantages of BCG vaccination, states: "It is believed, however, that the advantages of vaccination outweigh the disadvantages for tuberculin negative persons who are exposed to a definite risk of infection, especially if they cannot be retested frequently with tuberculin." This committee recommended BCG vaccination for those groups recommended by the American Trudeau Society, the American College of Chest Physicians, the American Medical Association, and the Medical Advisory Committee of Research Foundation.

The specific groups recommended for BCG vaccination by the American Trudeau Society are (1) doctors, medical students, and nurses who are exposed to tuberculosis; (2) all hospital and laboratory personnel whose work exposes them to contact with the bacillus of tuberculosis; (3) individuals who are unavoidably exposed to infectious tuberculosis in the home; (4) patients and employees in mental hospitals, prisons, and other custodial institutions where the incidence of tuberculosis is known to be high; and (5) children and certain adults considered to have inferior resistance and living in communities in which the tuberculosis mortality rate is unusually high.

There have been numerous inquiries from all parts of the United States as to where BCG vaccine may be obtained. In order to assist those interested, the following information is offered: BCG vaccine may be obtained by any licensed physician in the United States and its territories by writing to the laboratories of Research Foundation and the University of Illinois, the only institutions licensed to produce and distribute BCG in this country.

Sol Roy Rosenthal, M.D.
Research Foundation
70 W. Hubbard St.
Chicago 10.

MOUTH-TO-MOUTH AIRWAY RESUSCITATION

To the Editor:—The article on mouth-to-airway resuscitation by Safar and McMahon, in the March 22 issue of The Journal, page 1459, is of interest. I have used this simple principle in resuscitating infants since 1942 and find it uniformly satisfactory. Two other principles could be incorporated in the device described by Safar and McMahon. The lower end of the instrument should be shaped to fit into and to obtrude the esophagus. The mouthpiece needs a trap to stop interchange of secretions between patient and resuscitator, as used by De Lee. These points were described in an article published in the *American Journal of Surgery* (58:140-141 [Oct.] 1942).

An additional aid is to have a flow of oxygen directed at the nose of the person doing the resuscitation, thereby raising the oxygen content of the air blown into the patient's lungs. To my surprise, in an article published in 1817 by John King (*New York Medical Repository*), describing the delivery of an abdominal pregnancy by vaginal incision, the following statement appears.

"The child appeared to be still-born, but not being certain of that, I inflated the lungs through a tube, and was pleased to find it had borne the brunt of the day, without any fatal event."

How long can a good idea remain unappreciated?

Leonard R. Thompson, M.D.
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San Pedro, Calif.

SANITARY AND ACCURATE METHOD FOR COLLECTION OF STOOL SPECIMENS

To the Editor:—In the study of the hemolytic anemias it is important to have an accurate knowledge of the quantitative fecal urobilinogen. To obtain this information it is essential that the stool specimens be collected accurately over a stated period of time. This is often a difficult task, both in the hospital and at home. The usual methods of trying to dip the specimens out of bedpans or toilet bowls are both messy and haphazard, while the direct use of a container is often beyond the scope of the patient.

The use of Saran Wrap has solved this problem. This material is obtainable in most grocery stores. It is transparent, pliable, tough, waterproof, and chemically inert. To obtain the stool specimen the patient is instructed to place a sheet of Saran Wrap beneath the toilet seat or over the bed pan, leaving plenty of slack. The specimen is then passed as usual. The toilet seat is raised, and by bringing up the four corners of the sheet of Saran Wrap and twirling them together the specimen can be lifted up and deposited in a jar or container. For weighing or other processing the technician can remove the Saran Wrap containing the specimen from the container without soiling the fingers or the surrounding area.

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BUSINESS PRACTICE

SELECTING YOUR INVESTMENTS

Carl Holzheimer, Chicago

The considerations and the opportunities available in selecting investments or the organization of a lifetime investment program is highly personal and involves many details ranging from family circumstances to the economy of the United States and the world; I can, therefore, touch on only a few brief highlights. I shall not address my remarks to the details of possible investment programs in the areas of stocks, bonds, and savings. Perhaps physicians, as skilled professional men, will be more sympathetic than a lay group, since I doubt whether any physician would feel comfortable if he were called on to outline the medical diagnosis and resulting treatments that 500 laymen might follow during the rest of their lives. The personal element is basic, and I would first suggest that no investment program is practical or meaningful, nor can it be continued, without some preliminary determinations.

Preliminary Considerations for Investment

Personal Needs for Cash.—The first determination is one relating to personal needs for cash. I am not talking about piling cash in a safety deposit box but, rather, about bank balance—the bank balance out of which you and your family draw their monthly living. You, and you alone, must decide how big this should be. It is a matter of your own comfort. Some persons feel that any money in a checking account above a month's requirements and perhaps the minimum balance that the bank may demand is wasted. The money should be working. Others feel that they cannot be comfortable unless they have a big bank balance. How big? Well, perhaps three months, six months, or, in some cases, a year's living requirements. Beyond that, it becomes a bit unnecessary, and, if your personal feelings seem to require greater permanent cash figures, then perhaps your investments should follow a course rather different from the one I propose to outline. But the cash determination is point number one.

The Insurance Program.—In second place are the questions relating to the insurance program. Basic family protection should precede moneys devoted to investments of a fluctuating character, and insurance may be the most logical means through which specific needs can be fulfilled. You may have children for whose college education you want to provide, and they may be young enough to make that provision practical and relatively inexpensive through insurance. But, if it should be your choice to handle these obligations through insurance, set a principal insurance figure substantially larger than the costs that are now contemplated, perhaps as much as 50% higher.

The Individual Personality.—As we approach the field of investments itself, nothing is more important than an honest determination of your own personality. I refer, of course, only to those phases of your personality that relate to financial matters. In the investment counsel profession (in which I have spent my business life), we find many psychosomatic investors. There are people, and I confess that some are among your own profession, who are uncomfortable when assets are quoted in fluctuating figures. The same person who will buy a piece of real estate and never give it a second thought as long as it remains occupied and rent-producing will feel alarmed if he picks up the financial paper and finds his 100 shares of General Motors stock have gone down two points. I do not mean this to be accepted as a facetious comment. I am deadly serious. Your own peace of mind, your comfort, your ability to concentrate on your almost overwhelming medical problems, and your need to give your patients 100% plus of your time and mental accomplishments are so vital that you should make certain that nothing—certainly no investment procedure—upsets or disturbs them. You might be better off with $100,000 invested in real estate, which, as a matter of honest fact, can fluctuate $25,000-$30,000 in a few weeks, as against General Motors stock; you cannot escape the fact that General Motors stock went up or down a point, but you can be utterly oblivious to what you might sell your real estate for. If you feel, after genuine soul-searching, that you are prepared to arrange your investment future as coldly, as scientifically, and as impersonally as you do your medical research, then the remarks I now propose to make may be of some help.

Practicality and Investment

In my office in Chicago, the members meet as a partnership group quite frequently with no other purpose than the purpose of developing the most practical, the most realistic, and the most intelligent answer to the question of selecting others' investments. We are constantly aware of the fact that our

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Investment consultant and partner, Security Supervisors.

Read before the Doctor and His Practice Forum, Washington, D. C., March 27, 1958.

decision, however accurate it may be, is a temporary decision, and I cannot overstress the importance of the fact that investment decisions are temporary. Perhaps, in this respect, they do not differ too drastically from your own decisions in your diagnostic office. You decide that the patient has such and such a condition, and your examination may give you strong reason for believing that certain medical characteristics will predominate, if not throughout his life, for a very extended period. But you would be quick to tell him that your examination and your diagnosis provide no guarantee against an infectious invasion tomorrow morning. Nor can any investment decision avoid the danger that a similar invasion will upset the best laid plans.

These plans must be related first and foremost to the world in which we live. Any reliance on historical tradition is dangerous and almost certain to fail. Once upon a time it was believed that one bought bonds until he was satisfactorily provided for and then, perhaps, "speculated" in stocks. I have chosen the words intentionally. We have grown up (most of us) in an environment where our fathers and our grandfathers could conceive neither of the managed economies with which we daily cope nor of a situation in which bonds might be more "speculative" and stocks might be more "conservative." Most of the world, certainly most of the European countries and the financiers and the rich men of the Orient, have not been without traditions that include money as a major speculative element. Relative stability and convertible money historically bred in our fathers and our grandfathers the conviction that a dollar was a dollar and that the further we moved from dollars the more speculative we were. They could not conceive of a world in which the conservative Republican President, having spent his entire public political life insisting on balanced budgets and sound currency, said in a recent press conference that, under present circumstances, a deficit might be preferable to higher taxes.

You have heard so much about inflation that the word loses meaning, and I do not propose (if I can possibly avoid it) to add confusion. Let us be very simple about it. We have been living in a world where many considerations of a political nature (or, if you prefer, of a social nature) have taken precedence over what used to be called sound economics. We have witnessed a perpetual increase in prices, which is one way of saying that we have been living through a steady and so far uninterrupted trend toward lower value for our dollar. I suggest that this trend will not be reversed quickly nor by any appreciable amount, and, in speaking with conviction on this point, I am not intending to ignore the current doubts regarding the 1958 outlook. I am urging that you consider, in setting up your investment program, the broad, apparently inevitable sweep of the world economy and America's participation in it.

You should divide your investments between savings accounts, bonds, and stocks, but I think the evidence so overwhelmingly unfavorable to investments in dollars that I would urge that your savings accounts and bonds be held to minimums, minimums related to the personal factors I discussed earlier and to the over-all insurance program that should be related to your family circumstances. Cash requirements, savings requirements in dollar terms, should not be piled one on the other to such a degree that you stand still while adding depreciating dollars to a pile that buys less and less. Major emphasis, in the judgment of my firm, should be placed in partnerships in American business, which means, as a matter of practice, that you should emphasize common stocks. Here is a problem, perhaps a dilemma, because you cannot buy common stocks as you buy Treasury bonds. They are not alike, and they require a diagnosis quite as thorough and quite as elaborate as one through which you put a clinical patient. If your investment funds are adequate, and in this sense adequate, while a somewhat flexible term, roughly means $100,000, you would be very well advised to seek professional investment counsel. It is expensive, as good medicine is expensive. It is the cheapest possible advice, as good medical work is the cheapest available.

If your problem relates to lesser sums, there is no ideal answer insofar as the selection of common stocks is concerned, but a reasonable compromise is available through the purchase of sizable, well-established, well-rounded investment trusts. Here, moneys are pooled, expert statistical management is provided, and the results are roughly average. But, in this sense, average is substantially better than the results likely to be achieved by a busy individual devoting spasmodic and unorganized time to security selection.

Beyond the professional management of money which is provided by either of the methods I have just suggested, you are left with reliance on a variety of financial firms, but I think it is individuals rather than firms. In any given bank or brokerage firm, you may find an above-average individual on whose judgment you can safely rely. I cannot give you the measurements to apply to such a man beyond those you can give me to apply to an individual physician; his maturity, his general reputation, and the regard in which he is held by others in the investment field are helpful clews. Most important is the reaction that develops as he visits with you and the degree to which he may provide that peace of mind and elimination of investment concern, on which your successful medical life in part depends.

Conclusions

We live in an age far different from the *laissez-faire* period of classical economics. It may be that we will face other economic calamities, but it is as sure as such things can be that they will not follow the 1929 pattern. We are unwilling, as a people, to accept an orthodox follow-through of a consequential business decline without so upsetting government finances in attempts to prevent it that the further rapid depreciation of the dollar is likely to dominate the investment environment.

I urge you to avoid the momentary concerns about 1958 and set your program for a long, continuing inflationary trend. Develop your cash, your bonds, and your insurance for peace of mind. Commit all other assets to professionally managed stock investments in whatever way is most practical and conveniently available to you. Remember that, before the decline which is creating so much news got very far, the Federal Reserve Board changed its policy, the President changed his budget, and Congress changed from saving to spending. These matters are vital. They may well affect 1958 more favorably than we now think possible. They will surely dominate the future.

MEDICAL FILM REVIEWS

FOUR NEW FOREIGN FILMS ADDED TO A. M. A. MOTION PICTURE LIBRARY

Lung Resection: 16 mm., color, sound, showing time 83 minutes. Prepared by Dr. Jaroslav Prochaska in cooperation with Professor Dr. Jan Hromada and Dr. Jan Fisely, Prague. Produced in 1956 by the Studio for Popular Scientific and Teaching Films, Prague. Procurable on loan (service charge $4.00) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film begins with a discussion of the indications for pulmonary resection. X-ray pictures, including bronchograms, are used in differential diagnosis. Preceding an illustration of operative technique is a short discussion and presentation of type of anesthesia, position of the patient, and use of selected special instruments for the operation. The anatomy involved is described and demonstrated with the use of detailed animated diagrams. Operative techniques for pneumonectomy, lobectomy, and the various types of segmental resection are described and illustrated by the use of animated drawings, after which the actual operative technique is shown. This film will be of special interest to chest surgeons. It will also be useful in anatomy courses for senior medical students because of the excellent anatomic descriptions and demonstrations.

The Jugular Venous Pulse: 16 mm., color, sound, showing time 20 minutes. Produced in 1957 by the Wellcome Foundation Limited in collaboration with Dr. Paul Wood, O.B.E., M.D., F.R.C.P., University of London. Procurable on loan (service charge $3.00) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

The purpose of this film is to stress the wealth of information that is obtained clinically by observing carefully the wave form of the venous pulse, an art which has tended to become overshadowed by modern technical advances. It includes a demonstration of modern instrumental techniques used in the analysis of the wave form of the venous pulsation in the neck. The mechanism and the production of each of the component waves are considered, and, with use of a normal subject, it is shown that they may be easily recognized by observation at the bedside. Sir James MacKenzie's classical work on the venous pulse is described, and newer and more precise values are attached to this work. There is a complete physiological explanation of the venous pulse normally and under several pathological conditions. This is an excellent presentation, from both a technical and an educational point of view, and it is highly recommended for cardiologists, residents, interns, and medical students.

Structure and Function of the Middle Ear: 16 mm., color, sound, showing time 24 minutes. Prepared by Professor Ichiro Kirikae, M.D., University of Tokyo. Produced in 1956 by Iwanami Films, Tokyo. Procurable on loan (service charge $3.00) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

In this film, the structure and function of middle ears from lower vertebrates to mammals are comparatively observed. In the human middle ear, the vibration of the tympanic membrane and ossicular chain is observed by stroboscopic illumination. Also shown are the close connections between the minute structures of the ossicles, such as the bony fibers, the thickness of bony cortex, and the boundary stress distribution of ossicles, examined photoelastically. The fundamental purpose which this film might serve is to demonstrate by means of motion pictures under stroboscopic light the movements of the eardrum and of the conduction mechanism. This picture is useful as a teaching medium, since it gives a graphic demonstration of the action of the sound conduction mechanism. It also includes a demonstration of the lines of force as they are considered to be transmitted through the ossicular chain and a diagrammatic demonstration of the effects of contraction of the middle ear muscles on the auditory mechanism. The photography is outstanding. This film is highly recommended for students of otology as a visual asset in describing the sound conduction mechanism.

Hemorrhoids or Piles and the Early Detection of Rectal Cancer: 16 mm., color, sound, showing time 24 minutes. Prepared by A. Lawrence Abel, M.S., F.R.C.S., and H. Gordon Ungley, V.R.D., M.D., F.R.C.S., London. Produced in 1957 by Stanley Schofield Productions, London, for Warner Chilcott Laboratories. Procurable on loan (service charge $2.00) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

The purpose of this film is to present, graphically, a modern approach to differential diagnosis and treatment of external and internal hemorrhoids, with particular reference to the identification of associated pathological conditions of the anus and rectum. The introductory sequences define terminology and review normal anorectal anatomy. The need for detailed history taking is cited, followed by techniques employed in examination—abdominal palpation, proctoscopy, sigmoidoscopy, and x-ray. Surgical treatment, dressing, and postoperative care of external hemorrhoids are shown, as well as the location of internal hemorrhoids, their stages of development, common complications, and prognoses in untreated or improperly managed cases. Appropriate surgical, mechanical, and chemical methods of treatment are outlined. There is no indication as to the underlying etiology of these problems; however, this is a good teaching film, and the photography is excellent. It is recommended for proctologists, general surgeons, and residents.

LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Malpractice: Failure to Heed Complaints of Patient.—This was an action for damages resulting from the alleged careless treatment of the plaintiff by the defendant physician. From a directed verdict in favor of the physician, the patient appealed to the Supreme Court of North Dakota.

The plaintiff, having suffered from a skin rash in his armpits for about 15 years, consulted the defendant physician. The defendant concluded that the plaintiff had contact dermatitis and prescribed for him a cream-like ointment composed of "Histadyl and Surfacaine." Following this office visit, the defendant did not hear from the plaintiff for about 20 months. The plaintiff testified that during this period he used the prescription only once; that it burned his skin, so he went back to remedies he had used in the past, such as Stag cologne, Pragmatar, and rubbing alcohol. Later he ran out of Pragmatar, and he tried the ointment again. It again increased his discomfort, so he put it back in his medicine cabinet and went out and bought a new supply of Pragmatar. The following month he again went to the defendant's office. He testified that he told the defendant, "Don't give me the same stuff you gave me before, because that drives my skin wild." The defendant denies that such a statement was made, and the prescription given was in fact the same as the first one. A few days later the rash had become worse and the plaintiff had to be hospitalized.

About four and one-half years after the plaintiff first called on the defendant, the plaintiff asked another doctor to make a patch test on him with a portion of the second prescription and it was then found that the plaintiff was allergic to Surfacaine. The defendant had not made any patch tests during the time the plaintiff was under his care. The expert witness for the plaintiff, however, did not testify that the defendant had failed to follow the standard of practice common to the locality. Furthermore, he did admit that Pragmatar could have been a factor in the plaintiff's skin problems.

On appeal it was argued by the defendant that the plaintiff cannot establish a cause of action for alleged malpractice without introducing evidence of a medical expert to show the standard of care and skill in the Grand Forks locality involving the treatment of the particular affliction with which the plaintiff was affected. While this is ordinarily true, said the Supreme Court, we do not have that situation before us in this case. Here the negligence or want of care of the defendant, if any, is based on the conflicting testimony of the parties. The alleged negligence or want of care of the defendant consists of his failure to heed the warning of the plaintiff, if in fact such warning was given, by giving him the same prescription that the defendant had previously given him and which the plaintiff claims he told the defendant he did not want as it "drives my skin wild." The negligence or want of care of the defendant, if any, is further based upon his failure to find out from the plaintiff what he had given him for his skin affliction in April, 1952, if he did not remember, or if he did remember what he gave the plaintiff, in failing to inquire as to what results were obtained, the plaintiff's warning indicating that the first prescription was injurious to his skin condition. If the warning was given, it was the defendant's duty to ascertain from the plaintiff how he had used the prescription and to generally obtain information from him that would constitute a basis for determining what medication or treatment the defendant should prescribe. This is particularly true, said the court, as the defendant knew that a certain percentage of individuals are allergic to Histadyl and Surfacaine. If the plaintiff gave the warning he claims, ordinary prudence would prompt the defendant to inquire into the alleged injurious or harmful results from the use of the prescription. This the plaintiff claims the defendant did not do. On the other hand, the defendant denies that the warning was given and insists that he did ask the plaintiff some questions before giving the second prescription.

Whether the warning was given or not, said the court, was a question for the jury. The conflict in the evidence as to the alleged negligence or want of care of the defendant is not in any way due to expert medical testimony. It was based on nontechnical matters. The case was therefore remanded for a new trial so that the jury would have an opportunity to pass upon the issues involved. *Stokes v. Dailey*, 85 N. E. (2) 745 (N. D., 1957)

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Cor Pulmonale in Pulmonary Tuberculosis: 38 Cases with Anatomic Verification. J. M. Boettner, G. D. Serna and L. C. Maas. Tórax 6:241-248 (Sept.) 1957 (In Spanish) [Montevideo, Uruguay].

Autopsies performed on 62 persons who died of pulmonary tuberculosis revealed cor pulmonale in 38. These included 25 men and 13 women, between the ages of 20 and 40 years. There was hypertrophy of the right ventricle alone in 1 case, hypertrophy and dilatation of the right ventricle in 12 cases, and dilatation of the right ventricle alone in 25 cases. Hypertrophy of the right atrium was found in 34 cases, of the pulmonary artery in 13 cases, and of the left side of the heart in 8 cases. No significant lesions of the heart were observed. The tuberculous pulmonary lesions were very extensive in 34 cases and moderately extensive in 13. The type of pulmonary tuberculosis was exudative-caseous in 19 patients, mixed in 17, and fibrous in 2.

Cor pulmonale is the result of hypertension of the pulmonary circulation, either essential or secondary to circulatory or pathological pulmonary factors, with consequent overloading of the right ventricle, circulatory insufficiency, and eventual heart insufficiency. A clinical diagnosis is made by the appearance of dyspnea in patients with chronic or acute respiratory disease, accentuation of the second pulmonary sound on auscultation, a subxiphoid marked pulsation, a roentgen-ray image of increased size of the conus of the pulmonary artery, and an electrocardiogram showing hypertrophy of the right side of the heart. The changes of the heart observed by the authors at autopsy, in relation to the type of cor pulmonale, show that dilatation of the right ventricle alone is a characteristic of acute or subacute cor pulmonale; hypertrophy alone shows compensation, whereas both hypertrophy and dilatation show decompensation of a previously compensated cor pulmonale. The treatment of cor pulmonale consists of controlling pulmonary hypertention, either essential or secondary. Treatment of cardiac insufficiency is the same as that of any form of congestive heart failure. The results from either treatment are poor.

Alimentary Lipemia and Coronary Artery Disease in Two Racial Groups. A. M. Weissler, W. Shapiro and J. S. Gaskin Jr. J. Lab. & Clin. Med. 51:355-358 (March) 1958 [St. Louis].

While some investigators have demonstrated abnormal elevations in fasting and postprandial plasma turbidity and chylomicron counts in patients with coronary artery disease, others have been unable to demonstrate such elevations. Alimentary lipemia is demonstrable to some degree in all normal individuals after a fatty meal. If the intensity of this phenomenon is related to the development of coronary artery disease, then it might be expected that populations manifesting a higher incidence of this disease would demonstrate a greater degree of postprandial lipemia prior to the development of overt disease. There is evidence indicating that the susceptibility to this disease among the Negro population in North Carolina is less than among the white population. The purpose of the present study was to ascertain whether such a racial difference in the incidence of myocardial infarction was present in a North Carolina Veterans Administration hospital and to compare tests of alimentary lipemia in groups of Negro and white patients. Studies were made on 26 white and 26 Negro male hospital patients, between 20 and 47 years of age and without evidence of gastrointestinal or cardiovascular disease. These patients had been following their usual dietary habits prior to hospitalization and were studied during the first week of their admission while they were subsisting on 3,000 calorie diets (150 Gm. fat). The studies were begun the morning after a 10-hour fast. Two control samples of venous blood were drawn into heparinized syringes through indwelling needles. After this, each subject was given 100 ml. of 10% cream per square meter of hypothetical body surface area, and plasma specimens were taken at hourly intervals. No other food was allowed during the 6 hours of observation.

Optical densities were read against a water blank in a Beckman spectrophotometer at a wave length of 650 μ after the plasma was separated by centrifugation at 2,500 rpm for 15 minutes. The control and hourly values were plotted linearly and the areas under the curves derived by planimetric in-

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tegration. The group means for control and hourly values, as well as areas under the curves, were compared. When the hourly mean optical densities were compared, no significant differences between the white and Negro groups were noted. Similarly, the mean values for the areas under the lipemia curves were not significantly different. In an attempt to distinguish a possible difference in the occurrence of individual abnormal responses between the 2 groups, those subjects having 2 or more hourly levels greater than the mean +2 standard deviations were separated. Three white and 4 Negro patients fell into this group. Under the conditions of the present study, the 2 groups of patients behaved as though they were culled from the same population. The relative incidence of acute myocardial infarction among white and Negro male patients in North Carolina was estimated from the 280 cases of documented myocardial infarction at the Durham Veterans Administration Hospital; corrected for the relative admission rates, it was found to be 2.2 white to 1 Negro. The data are not consistent with the view that *intensified alimentary lipemia is a significant predisposing etiological factor in coronary artery disease.*

The Prognostic Value of the Tuberculin Test. M. Pardo de Tavera, E. de Leon, S. S. Lapuz and others. Bull. Quezon Inst. 4:231-235 (Dec.) 1957 [Manila].

Cases included in this study were picked from those of 1,909 youngsters admitted to the children's pavilion of the Quezon Institute. Seventy children of this group were selected, and these were divided into 2 groups. Group 1 included 31 patients who persistently gave negative reactions to the tuberculin test, despite the unequivocal existence of tuberculosis. The 39 children of group 2 gave a negative tuberculin reaction at the beginning, although they had tuberculosis, but converted to a positive reaction during the course of antituberculous therapy. *All the 31 children in whom the tuberculin test remained negative died,* whereas there were only 3 deaths among the 39 patients in whom the test became converted to positive. A persistently negative reaction in the face of active tuberculosis signifies a decidedly unfavorable prognosis.

Conversion of the tuberculin test from negative to positive during chemotherapy in tuberculosis is a good omen. Conversion has been found to precede or occur simultaneously with roentgenographic and clinical improvement in a majority of studied cases. In 33 patients improvement was evident at the time of conversion, in 3 patients conversion preceded clinical improvement, and in 2 others no improvement at all was noted during or after conversion. The authors invite confirmation or negation of the prognostic value of the tuberculin test during chemotherapy. This study affirms its worth as a prognostic tool.

The Decline of Rheumatic Fever: Recurrence Rates of Rheumatic Fever Among 782 Children for Twenty-One Consecutive Calendar Years (1936-1956). M. G. Wilson, Wan Ngo Lim and A. McA. Birch. J. Chron. Dis. 7:183-197 (March) 1958 [St. Louis].

The records analyzed were designed for documentation of the natural history of rheumatic fever. They were consecutive records of 782 children, born after 1916, who were registered in the cardiac rheumatic clinic of the New York Hospital and who had been under uniform, continuous, close medical and social service supervision. There were 370 males and 412 females, and analysis of the observations on them covered a time span from 1936 to 1956, with an age span of 2 to 20 years. For the majority of patients, clinic visits were made on a monthly basis, and all were encouraged to phone in case of any illness. Over the years, numerous clinical investigations were under way, requiring frequent clinic and home visits. During this 21-year period, 782 children who represented 5,664 person-years had a total of 613 recurrences, exclusive of 15 multiple recurrences within the same calendar year, giving a crude over-all rate of 10.8% per year. Twenty-one consecutive annual recurrence rates at ages 2 to 20 gave a mean rate of 9.8% per year. There was a statistically significant downward trend, with a slope of —0.4% per year, in the annual recurrence rates from 1937 to 1956. The mean annual recurrence rate for those with a recent attack (within 2 years) was 21.4 per 100 person-years, 3 times the rate of 6.0% for children free from a rheumatic attack for 2 or more years. There was a significant decline in the recurrence rates in both groups over the years.

A comparison of age-specific recurrence rates for the periods 1916-1943 and 1944-1956 revealed lower rates at almost every age in the latter period. The approximate chance of a recurrence in any one year for all children, 6 to 13 years of age, declined from 1 in 4 before 1944 to 1 in 7 between 1944 and 1956, and for ages 14 to 20 the chances fell from 1 in 16 to 1 in 35. The general improvement in the standard of living in Greater New York City over the past 2 decades was reflected in the socioeconomic composition of the clinic population: (*a*) the relative percentage of patients in the best environmental group increased, and those in the poorest socioeconomic status decreased; (*b*) recurrence rates were generally lower in the more favorable environmental groups; and (*c*) recurrence rates for the poorest environmental group did not reveal the decline noted for the total clinic population. The initial decline in recurrence rates antedated the antimicrobial era, and the over-all decline did not appear to be sharper during 1952-1956, when antibiotics were administered to patients either during febrile illness or as continuous prophylaxis. The decline in recurrence rates of attacks of the major manifestations of rheumatic fever coincided with the progressive improvement in socioeconomic status for patients observed in this clinic.

Preventive Techniques of Rehabilitation for Hemiplegic Patients. N. K. Covalt. GP 17:131-143 (March) 1958 [Kansas City, Mo.].

Techniques for restoring physical activity and independence to the hemiplegic patient must be instituted during the acute phase after a cerebral vascular accident. Unless the lesion is a minor or transitory one, deformities will start to develop within the first 2 or 3 days. Preventive procedures must be instituted, even though it may be impossible to determine for several days whether the patient will live or die. Any nurse, aide, or attendant caring for the patient at home can be instructed in these procedures. The majority of patients can be made almost, if not completely, independent within the first month after the stroke. When no program of any type has been instituted until a month, or many months, after the onset of the illness, physical rehabilitation requires long weeks of training and the assistance of physical and occupational therapists before deformities can be corrected. The types of deformities that follow cerebral vascular accidents are basically the same, irrespective of the cause or extent of the lesion or whether flaccid or spastic paralysis is present.

The author comments on various hemiplegic deformities, and measures to ward off such deformities are explained with the aid of diagrams. Incorrect elevation of head will result from pillows extending below the shoulders. This flexes the upper thoracic as well as the cervical vertebrae and rolls the shoulders forward. As a result, lung capacity is decreased, and the pectoral muscles are shortened. This tightens the shoulder girdle and limits arm abduction. The diagram showing the correct position for lying on the back shows the body flat, without pillows, and the feet placed against the footboard. Other diagrams show the following procedures: correct lying on the side; support for passive motion of the upper and lower extremities; moving about in bed from a back-lying position; moving the affected leg; turning on the side to reach the bedside table; coming to a sitting position on the side of the bed; lying in the face-down position; exercises in this position; moving from bed to chair; and retraining in walking.

The hemiplegic patient should never be allowed to forget that he still has 1 good arm and 1 good leg. These unaffected extremities will quickly weaken if they are not used actively. A basic rule in all rehabilitation is never to do passively for the patient those things that he can do, or can learn to do, actively for himself. Everything that is done for any patient puts him another step closer to becoming weaker and more helpless. Within the first 2 or 3 weeks, perhaps even at the end of the first week, if there is no respiratory distress, it is wise to teach the patient to turn over and lie in the prone position at least once or twice a day. This is restful and relaxing to the back and hip extensors. As soon as the patient learns to get into a wheel chair, he should learn to push it himself. Only the 1-arm-drive chair is really practical for any person who has the use of only 1 arm. The use of a wheel chair is only temporary for the majority of hemiplegics who are given the opportunity for early rehabilitation. Patients with mental confusion may be confused only because nothing of interest has been offered to attract their attention. Many who appear to have definite mental deterioration often clear up remarkably when they start attempting to try to care for themselves. Those with definite mental deterioration can be retrained in many of the simplest of their old habit patterns, and so become less of a burden.

Congenital Biologic False-Positive Serologic Test for Syphilis. J. F. Cannon. A. M. A. Arch. Int. Med. 101:620-622 (March) 1958 [Chicago].

Biological false-positive reactions are frequently observed in patients with vaccinia, infectious mononucleosis, malaria, leprosy, upper respiratory diseases, yaws, pinta, Colorado tick fever, relapsing fever, lymphogranuloma venereum, chancroid, measles, chickenpox, atypical pneumonia, infectious hepatitis, rat-bite fever, and disseminated lupus erythematosus. In fact, any febrile illness or immunization is a potential cause of false-positive tests. No patient who has recently had a febrile illness or immunization should be given a diagnosis of syphilis on the basis of serologic tests alone. A false-positive serologic test should be considered in all patients whose marital partners have negative serologic reactions. In all patients in whom there is a possibility of a false-positive serologic test, a careful history should be taken as to exposure, symptoms of intercurrent infection, and immunization, and a physical examination should be done for evidence of other etiological factors.

The cause of a false-positive reaction cannot always be determined. The author presents a family in which only the females had positive reactions to syphilis; the male members showed consistently negative tests. The positive tests were of low titer, and the results varied from time to time from positive to negative. The Treponema pallidum complement fixation test was positive in 2 examinations in which the serologic tests were negative. The Treponema pallidum immobilization test was always negative in this family. Therefore, the author thinks that the Treponema immobilization test should be performed whenever the Treponema complement fixation test is positive, so as to avoid an erroneous diagnosis of syphilis in patients with a congenital tendency to false-positive serologic reactions.

Primary Chronic Interstitial Nephritis (Pyelonephritis): Clinical, Experimental and Aetiological Observations. O. Gsell, H. K. v. Rechenberg and P. Miescher. German M. Month. 3:37-43 (Feb.) 1958 (In English) [Stuttgart, Germany].

The authors report on 22 women and 6 men, between the ages of 30 and 65 years, with primary chronic interstitial nephritis (pyelonephritis). The disease was caused in 22 patients by prolonged and excessive ingestion of acetophenetidin (Phenacetin) or acetophenetidin-containing analgesics. Of the remaining 6 patients, 1 had multiple myeloma with plasma-cell infiltration of the kidneys, 3 had chronic extrarenal tuberculosis, 1 had small multiple cysts with contracted kidneys, and 1, a chronic alcoholic, had an unilateral malformation of the kidney. Thus, in 80% of the 28 patients the chronic interstitial nephritis was an exogenous disease which could have been prevented. The total intake of acetophenetidin ranged from 10,000 to 200,000 tablets taken over a period of 7 to 15 years, with an average daily dose of 7.2 tablets, equivalent to 1.8 Gm. of the drug. At the time the clinical diagnosis of chronic interstitial nephritis was made, each of the 22 patients had taken an average total dose of 37,000 tablets or about 1 kg. (2 lb.) of the drug.

Three stages of the disease caused by the prolonged excessive intake of acetophenetidin were observed. A latent stage, the clinical diagnosis of which was not easy, was followed by a second well-defined stage of renal tubular insufficiency with normochromic anemia, polyuria, hyposthenuria, azotemia, and acidosis. It was often associated with electrolyte disturbances but not with a rise of blood pressure. The latter occurred only in the terminal stage of the disease, that of contracted kidney with renal failure. An inquiry made during the past year among patients of the medical polyclinic of the University of Basel, Switzerland, revealed that 33 patients had taken excessive amounts of acetophenetidin for prolonged periods. Of these 33 patients, 7 showed no clinical evidence of renal damage, 9 showed increased erythroclasis, and 17 had interstitial nephritis. The erythrocyte survival time was measured in all 33 patients and was markedly shortened in the second and third groups, depending on whether these patients had nervous symptoms only or showed signs of sulfhemoglobinemia or had acidotic renal insufficiency. A shortened erythrocyte survival time was produced in rabbits by prolonged feeding of acetophenetidin or acetophenetidin-containing compounds, but it has not been possible to reproduce the nephritis experimentally. It is suggested that the superimposed urinary infections which were present in 19 (60%) of the 33 patients, particularly cystopyelitis, may favor or precipitate the occurrence of interstitial nephritis.

Treatment of acetophenetidin abuse varies with the stage of the disease. In the first stage, social care and the prevention of further ingestion of the drug are important. Should the general practitioner be unsuccessful in his efforts, psychiatric advice should be sought and institutional treatment may become necessary. In the second stage, large doses of vitamin C and iron should be administered. Treatment is symptomatic and supportive once interstitial nephritis has occurred, and the infections of the urinary passages must be combated systematically. Prophylaxis of this new type of drug addiction might be theoretically simple, but such prevention is difficult to practice unless it has the assistance of mental hygiene in the broadest sense of the term.

SURGERY

Surgical Considerations in Repair of Ventricular and Atrial Septal Defects Utilizing Cardiopulmonary Bypass: Experience with 104 Cases. D. A. Cooley, J. R. Latson and A. S. Keats. Surgery 43:214-225 (Feb.) 1958 [St. Louis].

The authors used cardiopulmonary bypass in 162 patients who were operated on for various lesions of the heart and great vessels. This report is primarily concerned with a description of the technical details of surgical repair of isolated ventricular and atrial septal defects based upon experience with 77 cases of the former and 27 of the latter. The pump-oxygenator system employed consisted of a Sigmamotor pump and a stainless-steel bubble-diffusion oxygenator. Two heads were used on the pump removing blood from the venae cavae and returning it to the arterial system in measured amounts. Although at first a DeWall-Lillehei disposable plastic tube oxygenator was used, recently a permanent device has proved satisfactory. This oxygenator can be assembled before being sterilized, and it has been siliconized. Defoaming of blood was satisfactory, and oxygen concentration was 95 to 100%. Oxygen was introduced into the oxygenator at a rate approximately 10 times the rate of flow of blood, and carbon dioxide was never used.

At the beginning of perfusion when the caval tape tourniquets were closed, the patients were made slightly hypervolemic to maintain systemic mean arterial pressure at approximately 60 mm. Hg and to ensure adequate venous return at the caval catheters. Blood which was aspirated from the heart was collected in a calibrated chamber, and approximately equal amounts were returned to the patient. After the cavae were opened, the blood volume was restored to the preoperative level. Blood used for priming the system was drawn from donors on the day of operation. Light planes of general anesthesia were used for operations with cardiopulmonary bypass. Since the bubble oxygenator is an efficient device for removing all volatile anesthetics and carbon dioxide from the blood and since the priming blood in the extracorporeal system dilutes circulating nonvolatile drugs, the anesthesia presents many problems.

Once bypass was begun and the heart was empty, the lungs were allowed to deflate to provide maximum working space and quiet in the thoracic cavity. No difficulty was encountered in reexpanding the lungs after perfusion. Because of the bleeding tendency from the heparin effect immediately after perfusion, transfusion was continued at a moderate rate during closure of the incision. Cardioplegic agents were used routinely in repair of ventricular septal defects and in a few complicated atrial defects. Potassium citrate was the most effective cardioplegic.

The surgical technique is explained with the aid of drawings. There were 14 deaths among the 77 patients operated on for ventricular septal defects. The death rate was highest (35%) in the 20 infants less than 1 year of age, but in view of the poor physical condition of these infants, a salvage of 65% was gratifying. In the survivors functional results were satisfactory. There were 2 deaths in the 27 patients operated on for atrial septal defects. Both patients, aged 50 and 42 years, respectively, had advanced stages of cardiac distress before operation. Patients operated on for atrial septal defects were older than patients with ventricular defects because, as a rule, atrial defects do not cause severe disability in early childhood. The authors are convinced that cardiopulmonary bypass is superior to closed, semiclosed, or open hypothermic procedures, since it provides the extra margin of safety and sufficient time to repair all types and sizes of atrial defects.

Traumatic Rupture of the Spleen from Nonpenetrating Injuries. L. Parsons and J. E. Thompson. Ann. Surg. 147:214-223 (Feb.) 1958 [Philadelphia].

This report is concerned with 26 patients with splenic rupture caused by nonpenetrating injuries, admitted to Roosevelt Hospital, New York, from 1941 to 1956. Six patients with penetrating injuries of the spleen were also admitted, giving a total of 32 cases of splenic laceration. During this period, 64 splenectomies were performed for conditions primarily in the spleen, 29 for splenic laceration due to trauma, and 35 for other conditions. The incidence of splenic rupture from nonpenetrating injury and resulting splenectomy has remained relatively constant from year to year. The spleen seems to be the abdominal organ most commonly injured from nonpenetrating injuries to the trunk. Its location and anatomic features are primarily responsible for its susceptibility to injury from external forces and from abdominal surgery directed toward neighboring organs. The adult male in his 3rd and 4th decade of life shows the greatest predisposition to this injury. Automobile accidents are the commonest cause of splenic rupture. Falls, such as occur in the normal activities of everyday living, are the next most common cause.

No evidence was found of spontaneous rupture of the normal spleen. Injuries to the left kidney and rib-cage fracture were the most common associated injuries. "Delayed rupture" may result from rupture of a subcapsular hematoma or exacerbation of hemorrhage that was initially controlled by the tamponade effect of clotted blood. The treatment for suspected splenic rupture is celiotomy. Splenic laceration requires splenectomy. Mortality among patients with rupture of the spleen is dependent on the number and nature of associated injuries and on the delay in instituting proper therapy. Shock, unresponsive to treatment, does not contraindicate surgical treatment.

Myocardial Revascularization: A Comparison of Internal Mammary and Subclavian Artery Implantation in the Laboratory. M. C. Fuquay, L. S. Carey, E. V. Dahl and J. H. Grindlay. Surgery 43:226-235 (Feb.) 1958 [St. Louis].

Implantation of the internal mammary artery was performed in 25 dogs by dissecting the artery free of the chest wall from the 2nd or 3rd to the 6th or 7th intercostal space on the left. The artery was ligated and divided at the level of the 7th rib, and the proximal portion, with 2 to 4 freely bleeding intercostal branches 2 to 6 mm. in length, was drawn into a previously made tunnel in the wall of the left ventricle. The tunnels varied between 2.5 and 3.5 cm. in length and were at a depth in the myocardium approximately midway between the epicardium and the endocardium. Implantation of the subclavian artery was performed in 12 dogs after dividing the vessel distal to its 4 branches and drawing the free portion of the artery, with its branches freely bleeding, into a tunnel in the left ventricle. In this procedure the branches were 0.5 to 1 cm. in length. In both procedures the distal end of the implanted vessel was ligated and attached to the epicardium by a cotton stay suture.

The results suggested that implantation of the internal mammary or the subclavian artery into the myocardium of the dog will afford some protection against death when the descending branch of the left coronary artery is ligated. There is no marked difference between the 2 procedures in the ability to protect against death. However, implantation of the subclavian artery appears to offer greater protection against the occurrence of infarction. The subclavian artery is more likely to remain patent after implantation than is the internal mammary artery, as indicated by the percentage of each group in which patency was demonstrated. Histological studies revealed a greater degree of obliteration of the lumen in the internal mammary implant owing to proliferation of the intima. A larger proportion of patent implants in the surviving animals of the internal mammary group, as compared with the nonsurvivors, indicates that survival depends to some degree upon a patent implant. The subclavian artery appears to offer better opportunity for the development of collateral channels than does the internal mammary artery, as shown by roentgenograms made after injection of contrast medium and vinyl acetate casts of the implanted vessels in both groups. As stated previously, definite conclusions could not be drawn regarding the actual size of the collateral vessels. However, while there is no doubt that collateral channels exist, it must be concluded that they are of a magnitude that will allow only relatively small blood flow at normal pressures. Flow determinations performed in each group of animals indicated that implantation of the subclavian artery might allow a greater volume of blood flow to the heart than implantation of the internal mammary artery.

Dumb-Bell Ganglioneuromata of the Spine with a Report of Four Cases. R. H. Shephard and D. Sutton. Brit. J. Surg. 45:305-317 (Jan.) 1958 [Bristol].

The authors reviewed the literature on dumbbell ganglioneuroma and found reports of 11 cases. They present detailed histories of 4 additional patients with this type of tumor, and since no special search was made for their own 4 cases, they feel that such tumors probably occur more frequently than the literature would suggest. Ganglioneuroma of the nondumbbell type is, of course, much more frequent. A collected series of 260 cases of ganglioneuroma included only 9 (3.5%) of the dumbbell type. The term "dumbbell" is used to describe tumors of characteristic shape; the term "hour-glass" has also been used. The most usual variety has a smaller intraspinal component with a larger paraspinal component joined by a constricted portion or neck occupying the intervertebral foramen. Four groups of dumbbell spinal tumors have been differentiated: (1) tumors situated entirely within the spinal canal but being partly intradural and partly extradural; (2) intradural and extradural tumors with a paravertebral extension; (3) extradural and paravertebral tumors; and (4) foraminal and paravertebral tumors. A tabulation of the main features of 15 patients with dumbbell ganglioneuromas of the spine available for study revealed several significant features: 1. The anatomic localization of the lesions is predominantly thoracic or thoracolumbar. 2. Most of the patients showed an onset of symptoms in infancy (6 cases) or childhood (4 cases); this is in marked contrast to dumbbell neurofibromas in which the onset of symptoms is usually in adult life. 3. The tumors are benign, and provided that operative removal is undertaken before irreversible changes have been induced by the cord compression, the prognosis appears relatively good. Ganglioneuromas are tumors of the sympathetic nervous system.

Three basic types of tumors of the sympathetic nervous system have been classified, each varying in degree of malignancy and each being derived from a different cell type: (1) neuroblastoma, derived from neuroblasts and highly malignant; (2) chromaffinoma or paraganglioma, derived from pheochromoblasts, with about 15% becoming malignant; and (3) ganglioneuroma, derived from adult ganglion cells and benign. However, it is possible for intermediate types to occur, and these form a 4th group of mixed tumors, which are thought to be derived from cell-nests and which may become malignant. If the intraspinal and paraspinal portions of the tumor have been removed, there is no recurrence. If the intraspinal portion only is removed, then further extension through the enlarged intervertebral foramen from the paraspinal portion may occur, producing recurrence of symptoms. Similarly, removal of a paraspinal tumor without recognition of a foraminal or intraspinal extension may be followed by paraplegia or regrowth of the paraspinal mass.

Eleven of the 15 patients with dumbbell ganglioneuroma were known to have had paraplegia. This is one of the most important presenting features and forms a disability for which urgent relief is required. In 11 of the 15 patients, the intraspinal portion of the tumor was extradural, in 2 it was intradural, and in 2 the site was not clearly stated. With dumbbell neurofibromas there is much more commonly an intradural component. This difference probably arises from the differing site of origin, ganglioneuromas arising from sympathetic ganglions or their primordia and neurofibromas from spinal nerves or their roots. The roentgenologic aspects that may permit a preoperative diagnosis are discussed. A radical policy toward treatment may be appropriate, especially in children, before irremediable neurological damage is produced.

One Hundred Colon Cancers. J. F. Bishop. J. Iowa M. Soc. 48:133-139 (March) 1958 [Des Moines].

Fifty-one men and 49 women, between 34 and 87 years of age, were operated on for cancer of the colon. In 60 patients the tumor was 15 cm. or less above the anus and was considered to be rectal, in 36 patients the tumor was in the sigmoid, and in the remaining 4 the exact site of the tumor is not stated. Ninety-nine patients had adenocarcinoma, and 1 had a squamous-cell lesion. One hundred fifteen operations were performed, with 5 surgical deaths representing a mortality rate of 4.3%. Sixty-six per cent of the patients were in the 5th and the 6th decade of life. Bleeding was the most common first symptom. Fifteen patients were obviously incurable at the time of the operation, and 85 offered some prospects for a cure. Seventy-three did not require gastric suction in the postoperative period. Twenty-four of the 100 patients operated on had recurrences of their cancer within 4 months to 2½ years after the operation. Forty-two of 68 patients operated on 4 or more years ago in hope of a cure lived for at least 4 years; thus, the 4-year survival rate was 62%.

Surgical Treatment of Esophageal Hiatus Hernia: A Description of Some Important Details in the Technique of Repair. F. E. Johnson. Minnesota Med. 41:94-98 and 113 (Feb.) 1958 [St. Paul].

The author reviews observations on 25 patients who were operated on for hiatus hernia. On the basis of the symptoms and from the findings at operation, he differentiates 2 groups of patients. The first group includes those patients who had excruciating, deep, subxiphoid pain which bores directly through to the back or around both costal margins to the back. This pain appears suddenly, without warning, persists steadily at maximum intensity for varying periods, and then suddenly and completely disappears. Except for moderate epigastric voluntary muscle-guarding during the attack of pain, the physical examination and all laboratory and x-ray studies are normal. This type of hernia is frequently not recognizable by roentgenoscopy, and the diagnosis may have to be based on the characteristic clinical picture. Failure to realize this may lead to the unjustified diagnosis of psychoneurosis, or even to the erroneous removal of organs in a desperate attempt to bring relief to these patients. At operation the hiatus is usually found to admit 2 fingers into a preformed sac. The finding of a preformed peritoneal sac is of prime importance, since by exerting moderate pressure one can normally insinuate 2 fingers into the esophageal hiatus. The excruciating pain associated with this small hiatus hernia can be best explained on the basis of visceral spasm involving the herniated portion of the stomach. The problem here is the mechanical one of herniation through an abdominal wall defect.

The symptoms in the second group of patients, with the possible exception of gastric ulcer, are due to reflux esophagitis. They include retrosternal burning (heart burn), eructation, dysphagia, vomiting, flatulence, gastrointestinal bleeding, and esophageal stricture. In this group, the diagnosis is made by the roentgenologist somewhat more easily, but 2 or more roentgenologic examinations may be necessary to visualize the hernia. At operation, the hiatus tends to be slightly larger and frequently admits 3 fingers into a preformed sac. This group of patients presents the double problem of a diaphragmatic defect and incompetence at the esophagogastric junction. These problems are both mechanical.

Experimental work suggests that the acute angle of insertion of the esophagus into the stomach is the factor of importance in maintaining the competence at this union. The author cites additional circumstantial evidence to support this experimental study: 1. In careful dissection of the esophagogastric area in autopsy specimens, it was found that in the presence of a significant hiatus hernia there tended to be effacement of the acute angle of insertion of the esophagus to the stomach as compared with those specimens in which the esophageal hiatus was normal. 2. A real clinical test of the importance of the acute angle of esophagogastric union in making this junction competent is presented by those patients who have had a resection of the esophagus. In 5 such patients an attempt was made to restore the normal esophagogastric angle. Postoperatively these patients had no clinical symptoms of regurgitation, and roentgenologically the union was competent in spite of the fact that it was now impossible for a "lower esophageal sphincter" or "a diaphragmatic pinchcock" to function.

The Solitary Pulmonary Nodule: A Review of 236 Consecutive Cases, 1944 to 1956. R. R. Taylor, L. N. Rivkin and J. M. Salyer. Ann. Surg. 147:197-202 (Feb.) 1958 [Philadelphia].

At Fitzsimons Army Hospital in Denver attempts to separate malignant and nonmalignant disease presenting as a solitary pulmonary nodule on the basis of history, sex, age of the patient, roentgenograms, physical findings, skin tests, and laboratory procedures presented the usual difficulties. An analysis was made of the records of 236 patients ranging in age from 17 to 74 years and having clinically undiagnosed solitary intrapulmonary lesions varying in size from 1 to 6 cm. on roentgenograms. These patients, including 208 men and 28 women, had been operated on over a 12-year period. One of the patients died after thoracotomy (a surgical mortality of 0.4%). Histological studies revealed granulomas resulting from tuberculosis or fungus infections or of undetermined etiology in 183 (or 77.6%) of the lesions, malignant tumors in 23 (or 9.7%), benign tumors in 10 (or 4.2%), and miscellaneous lesions, such as cysts, abscesses, fibrosis, and infarction, in 20 (or 8.5%).

The 23 patients with malignant tumors included 17 with bronchogenic carcinoma, 1 with alveolar carcinoma, 2 with metastatic carcinoma, and 3 with bronchial adenoma.

Military hospitals consistently show a somewhat lower incidence of primary pulmonary malignancy among patients with solitary pulmonary nodules than do civilian hospitals. The authors believe this difference to be due to (1) the lower age groups, (2) the higher frequency of pulmonary mycotic infections seen in military hospitals, and (3) distortion introduced into some series by including large intrapulmonary masses which give a much higher incidence of tumor. On the basis of the data obtained in this study, the following conclusions are drawn, particularly with regard to military hospitals. The patient with an undiagnosed solitary intrapulmonary nodule has about a 3-out-of-4 chance of having a granuloma and a 1-in-10 chance of having a malignant tumor. If all cases with any calcification or lamination are excluded from consideration, the chance of malignancy increases to 1 in 8. If the lesion does not have sharp distinct borders, yet still appears as a nodule, the risk of malignancy increases to 1 in 2. The age-group distribution in this study would indicate a malignancy risk rate of 2.5% at 20 to 29 years of age, 6% at 30 to 39 years, 9% at 40 to 49 years, and 47% and up after age 50 in the presence of a solitary pulmonary nodule. Combinations of age, sex, smoking habits, lack of calcifications or laminations, and x-ray appearance of the borders as well as growth rates appreciably alter the risk rate. In this particular study, if all patients with solitary pulmonary nodules which had fuzzy borders or were greater than 4 cm. in diameter had been subjected to exploratory thoracotomy, every malignant tumor would have been discovered.

GYNECOLOGY & OBSTETRICS

Endometriosis of the Small and Large Intestine. R. S. Boles and P. J. Hodes. Gastroenterology. 34: 367-380 (March) 1958 [Baltimore].

The authors are of the opinion that gastroenterologists are not sufficiently aware of intestinal endometriosis. Surgeons have reported on this condition and have called attention to the difficulties met with in its differential diagnosis. The authors present the histories of 12 patients with pelvic endometriosis involving the small and large intestine. As pelvic endometriosis is most common between 25 and 40 years of age and is usually associated with infertility, it is of interest that of the 9 married women 6 had children and that the average age in this group was 40 years, the youngest patient being 23 years old and the oldest 52 years. It is probable that many young women have unrecognized pelvic endometriosis that is causing various so-called functional or reflex disorders of the intestinal tract. The disease often escapes recognition, and a positive diagnosis is infrequently made before operation. It may simulate appendicitis and terminal ileitis in its acute manifestation and chronic diverticulitis and cancer of the rectosigmoid in its more chronic form, especially in older women. It commonly invades the serosal surfaces and the deeper layers of the intestine, the mucosa invariably escaping. Endometriosis may be more often suspected as a cause of obscure functional and organic lesions in the intestinal tract if it is kept in mind that the symptoms and physical signs frequently are associated with dysmenorrhea and menstrual disturbances and that pelvic examination will in most cases reveal evidence of the disease in the pelvis.

The treatment of endometriosis consists of routine observation, surgical intervention, or irradiation depending upon the severity of symptoms, the patient's age, and the removability of the major lesions. In the absence of complications conservative treatment is desirable, particularly in women of the child-bearing age with the preservation of ovarian and, if possible, menstrual and procreative functions. In recent years androgen therapy seems to have been efficacious in some cases. The history of the oldest patient in the group, a 52-year-old woman who was subjected to a sigmoid colectomy and in whom the pathological diagnosis was endometriosis of the sigmoid colon and left ovary, illustrates the difficulties encountered in the differential diagnosis between endometriosis and carcinoma of the sigmoid colon. Some of the histories show that there may be early involvement of the colon in pelvic endometriosis without significant intestinal symptoms. Another case history illustrates how the acute symptoms and physical findings of active endometriosis may simulate acute appendicitis. The 12th patient presented illustrates what may well be a syndrome hitherto unrecognized in the literature of disordered motor function of the small intestine due to peritoneal irritation; the latter was the result of free endometrial fluid in the peritoneal cavity arising from pelvic endometriosis. For several years the patient's illness had been thought to be of a functional nature.

Delivery in the Physiologic Position. F. H. Howard. Obst. & Gynec. 11:318-322 (March) 1958 [New York].

The author reports on 219 women, 52 primiparous and 167 multiparous, who were delivered in the modified sitting position with no sequelae. A new type of delivery table was used. The table has a device to lift the back of the table from horizontal to vertical. The knee crutches are broad. The patient is placed on this table in the lithotomy position, and the back is then elevated through an arc of 90 degrees, wherein the lithotomy position becomes a sitting position. With the aid of this table, delivery in the physiological position, which is a sitting or squatting position, is practical. It is satisfactory from the mother's viewpoint, since the use of the physiological position makes delivery easier, and it should result in less intracranial damage to the child than is now encountered by the use of the various recumbent positions which are unphysiological and abnormal. It is not claimed that the use of the physiological position will prevent all instances of cerebral palsy, but it is believed that its use will reduce the number and that such reduction will be among those with uncomplicated pregnancy. In patients with toxemia, it seems advisable to augment control of blood pressure and fluid balance when early delivery in the physiological position is performed.

Virus Diseases in Pregnancy and Congenital Defects. A. B. Hill, R. Doll, T. McL. Galloway and J. P. W. Hughes. Brit. J. Prev. & Social Med. 12:1-7 (Jan.) 1958 [London].

To determine the probability that an illness of the mother during her pregnancy will give rise to a congenital malformation in the infant demands a prospective method of inquiry. One way of securing such records in Great Britain has been described in an earlier paper. The data there used were automatically collected by societies operating up to July 5, 1948, under the National Health Insurance Acts. Under these acts, if an employed and insured married woman drew benefits for a sickness which caused her to be absent from work, she had to present a sickness certificate giving the dates of her illness and the general practitioner's diagnosis of its cause. If she subsequently gave birth to a child, she would be entitled to draw maternity benefits, and the date of birth would therefore also be recorded by the approved society. By these means information was collected on 22 cases over the space of some 2 years; the series included 10 cases of rubella and 6 of measles. The infants were specially examined not long after birth, and 1 case of congenital heart disease as a result of the mother's having rubella in the first month of pregnancy was observed. With the aid of the Ministry of Pensions and National Insurance, the authors were able to collect similar records for 100 women reported to have suffered from rubella, measles, mumps, or chickenpox during or shortly before pregnancy. Seven further cases were brought to their notice privately but prospectively (i. e., before the birth of the child).

Of these 129 cases, 10 were omitted for various reasons, and 119 were analyzed. They included the cases of 44 women with rubella (6 preceding and 38 during pregnancy), 35 women with mumps (6 preceding and 29 during pregnancy), 30 women with chickenpox (6 preceding and 24 during pregnancy), and 10 women with measles (4 preceding and 6 during pregnancy). One of the women who had chickenpox gave birth to twins, so that altogether 120 babies were available for study, of whom 110 were personally examined by 1 of the authors shortly after birth. In the remaining 10, information was available from a hospital or a private physician. Further information was obtained after the child had reached at least 3 years of age. There was no evidence that mumps or measles had had any deleterious effect upon the fetus. With chickenpox, there was also no evidence of the production of congenital defects, but the proportion of live-born children with low birth weights was relatively high (although the difference was not statistically significant). With rubella occurring early in pregnancy, the well-known congenital defects of heart, vision, and hearing were observed. By the addition of these present cases to similar published records, some estimates are reached of the risks involved with rubella in different stages of pregnancy. An incidence of 6 affected children out of 12 whose mothers had rubella in the first month of pregnancy (50%) declines to 5 out of 20 in the second month (25%) and to 3 out of 18 in the third month (17%). With 54 women in whom the attack of rubella occurred in the second and third trimesters, 51 infants were unaffected, and only 1 of the 3 affected cases seemed likely to be attributable to the preceding rubella. Other published data have shown both considerably higher and considerably lower incidence rates of congenital defects after rubella in early pregnancy. It may be, therefore, that the risk varies.

PEDIATRICS

Study of the Air Content and State of Expansion of the Infant Lung: Reference to the Problem of Sudden Death. M. G. Goldberg and M. Wolman. A. M. A. Arch. Path. 65:263-271 (March) 1958 [Chicago].

The authors studied the lungs of 85 infants up to the age of 2 years and of stillborn infants on whom autopsies were performed. Of each lung, 1 lobe was inflated with air, another lobe was deflated, and the 3 other lobes were not manipulated and served as controls. Areas with increased alveolar volume (overexpansion), varying greatly in size, were often observed. It was found that "overexpansion of the alveoli" is not always identical with "emphysema" (increased air content), since in many areas of increased alveolar volume the distended alveoli contained fluid instead of air. Overexpansion was caused in some instances by blood, edema fluid, or other liquids. Three different types of atelectasis were recognized, namely, diffuse atelectasis, polarized atelectasis, and microatelectasis. Microatelectasis around areas of focal emphysema was commonly found. The term dysaeration was proposed for the association of focal emphysema and microatelectasis. Dysaeration was found to occur after obstruction of air passages by exudate, mucus, or other fluids and forced inspiratory movements. It is reasonable to assume that the frequency of dysaeration in young infants and especially in premature newborn infants is due to the small caliber of the air passages in relation to the size of mucus droplets and desquamated epithelium. It is suggested that through a vicious circle of anoxia, forced inspiration, and increased dysaeration this process may lead to sudden death in infants.

The findings of this study are considered to be relevant to the therapeutic and prophylactic approach toward anoxic states in infants. The various drainage procedures in use might help to avoid the formation of dysaeration, but the administration of air or oxygen under pressure to infants is a dangerous procedure, because it might precipitate focal emphysema and microatelectasis in infants in whom liquid or mucus is present anywhere along the respiratory tract. The use of drugs to diminish hyperventilation might be considered. The problem of rational mucolytic therapy effective in diminishing mucus secretion requires further study. At present, drainage methods are probably the only answer to the removal of fluids from the respiratory tract.

Immunization and Epidemiology of Diphtheria in Schleswig-Holstein in the Years 1946-1956. H. Knothe and W. Laforet. Ärztl. Wchnschr. 13: 145-148 (Feb. 14) 1958 (In German) [Berlin].

With the aid of tabulated figures the authors demonstrate that the incidence of diphtheria (morbidity) in Schleswig-Holstein has been decreasing from a high of 56 per 10,000 population in 1946 to 0.5 per 10,000 in 1956. A similar although not quite as decided a decrease in diphtheria morbidity (from 33 to 1.6) has also been noted in all of Western Germany. The diphtheria morbidity in Germany is, however, still above that in other countries of western Europe. Investigations carried out by the authors indicated that immunization against diphtheria, at any rate the number of vaccinations, was not the decisive factor in the decrease in diphtheria morbidity. On the contrary, they regard the decrease as a manifestation of a wave movement in the direction toward a wave trough, which may have been reached or will be reached shortly. It has yet to be proved whether active immunization against diphtheria will succeed in definitely breaking through the rhythmical periodicity and abort the next epidemiologic wave. In view of the limited extent of protective diphtheria vaccination in Schleswig-Holstein, the authors doubt that this will be the case.

Since therefore the possibility exists that in the coming years the diphtheria morbidity will again increase, it seems dangerous to adopt the attitude taken in some counties of Schleswig-Holstein that, in view of the favorable epidemiologic situation, protective immunization against diphtheria can be dispensed with. The authors agree with those observers who have emphasized that active immunization is an effective weapon in the combat of diphtheria as such. Thus, whereas in the counties in which there is a large number of vaccinated persons a new epidemic wave will probably cause a smaller number of diphtheria attacks and also a lower lethality, the lack of protective vaccination in other counties will doubtlessly cause a higher morbidity and lethality. The authors recommend that, despite the present favorable epidemiologic conditions, active immunization against diphtheria should be carried out generally among the child population and should not be limited to a few counties in which the protective effect of vaccination is appreciated.

DERMATOLOGY

Poison Ivy (Rhus) Dermatitis: An Experimental Study. A. M. Kligman. A. M. A. Arch. Dermat. 77:149-180 (Feb.) 1958 [Chicago].

This essay reviews current information on Rhus dermatitis. The family Anacardiaceae includes a number of related plants which are dermatogenic. The 2 most important in the United States are Rhus radicans (poison ivy) and R. toxicodendron (poison oak). The Rhus allergens have the common chemical skeleton of a catechol with a 15-carbon side-chain in the 3-position. They differ only in the degree of unsaturation of the side-chain. The allergenic principle is present in all parts of the plant which contain resin canals. Its release requires bruising of the tissue. All persons can become Rhus-sensitive with sufficient exposure. There is no evidence of a spontaneously acquired immunity. About 50% of young adults will react positively to the application of bruised leaves. Darkly pigmented races have a lower incidence. Sensitivity gradually declines with time, irrespective of continued casual exposure. Of persons over 60, a minority are Rhus-sensitive. Those who react to strong concentrations of the saturated Rhus allergen (pentadecyl catechol) but not to the leaf are termed subclinical reactors. Presumably most of these have lost their clinical sensitivity. Once lost, sensitivity is not easily reestablished except by severe exposure and then only in a minority of instances. Rhus sensitization cannot be prevented by prior feeding or contact with the allergen.

The depth or degree of sensitization is revealed by quantitative patch tests with serial dilutions. The titer, beyond which further dilution causes no reaction, is a meaningful measure of the degree of sensitization. The theory is advanced that allergic contact dermatitis is a generalized state of sensitivity with chief reactivity localized in the skin. Immediately after or concomitant with severe widespread Rhus dermatitis, the skin may show 2 opposite types of reactions: supersensitivity or hyposensitivity. The unusual consequences of Rhus dermatitis include eosinophilia, kidney damage, urticaria, and dyshidrosis. There is no practical topical measure which will adequately protect against field exposures to Rhus plants. This includes soap and water washing, barrier creams, and detoxicants. Topical therapy will not abort or moderate Rhus dermatitis as do the usual nonspecific dermatological measures. Corticosteroids are the only systemic agents with a demonstrated ability to benefit Rhus dermatitis. The treatment of Rhus dermatitis by the administration of Rhus allergens during the acute attack is irrational and hazardous.

An Oral Antigen Preparation in the Prevention of Poison Ivy Dermatitis: Results in 455 Cases of Ivy Sensitivity. E. R. Gross. Indust. Med. 27:142-144 (March) 1958 [Chicago].

The poison ivy plant and its allies are major occupational hazards to tree service workers, telephone and electric-power linesmen, pipeline layers, woodsmen, farmers, and men in the armed services. Tree service workers, because of their frequent contact with poison ivy year after year, make excellent subjects for studies of desensitization methods. Attempts to prevent poison ivy dermatitis by ingesting parts of the poison ivy plant or its oleoresins are as old as the American Indian practice of chewing poison ivy leaves. Parenteral administration of poison ivy antigen is objectionable for several reasons: (1) the method is not suitable for frequent administration of small doses; (2) inflammatory reactions at the site of injection are common; and (3) incipient poison ivy dermatitis may flare up as a severe dermatitis. In oral administration, the nature of the vehicle is important. An extract for the prevention of poison ivy dermatitis should be suitable for oral administration, should be in a nonoily vehicle, and should be stable. The author reviews experiences with an extract that meets these requirements. The preparation is a stabilized extract of fresh poison ivy leaves and stems in 70% alcohol. The uniform potency of the extract makes it possible to prescribe a standardized dosage.

Four hundred fifty-five subjects, including private patients and the employees of a tree service company, were given the extract orally in small daily doses for 6 weeks prior to the poison ivy season and less frequent maintenance doses during the season. All subjects had a previous history of sensitivity to poison ivy. During the season, after prophylaxis, 76.9% of the subjects were either free of poison ivy dermatitis or experienced milder attacks. Two of the patients complained of nausea and gastrointestinal disturbances. There were no other reports of untoward side-effects.

UROLOGY

Relations Between Hypertrophy and Carcinoma of the Prostate. W. Dontenwill and H. Wulf. Arch. Geschwulstforsch. 12:14-18 (No. 1) 1958 (In German) [Dresden, Germany].

The authors investigated whether carcinoma of the prostate develops more often in patients with hormone-dependent hypertrophy of the prostate than in patients free from prostatic hypertrophy, that is, whether hypertrophy of the prostate is a precancerous lesion. They studied the records of 880 patients from whom hypertrophic prostate tissue had been examined at the pathological institute of the University of Kiel from 1942 to 1951. The later course of 556 patients could be traced, but the 120 who died during the first 2 years are omitted from further consideration. Four hundred twenty-four of the remaining 436 patients (97.25%) remained free from prostatic carcinoma, while in 12 patients (2.75%) carcinoma of the prostate was established either histologically or clinically. The authors also investigated the incidence of simultaneous existence of hypertrophy of the prostate in 122 patients with carcinoma of the prostate and found that 57 (47%) also had hypertrophy. Autopsy studies on unselected cases of pathological institute reported by others revealed that the incidence of carcinoma of the prostate between the ages of 66 and 75 years is 2.7%; in the 220 patients of this age group who were among the patients with prostatic hypertrophy studied by the authors, the incidence was the same. Thus, prostatic carcinoma is only of average frequency after prostatic hypertrophy, which therefore cannot be regarded as a precancerous condition.

INDUSTRIAL MEDICINE

Surgical Therapy in Tuberculosilicosis. N. C. Andrews, P. C. Pratt, L. E. Wilt and K. P. Klassen. Am. Rev. Tuberc. 77:62-72 (Jan.) 1958 [New York].

While few patients hospitalized with tuberculosilicosis will have a distribution of disease suitable for surgical intervention, some can be treated by this method. Forty-eight patients were admitted to the Ohio Tuberculosis Hospital during the past 6 years with a history of occupational exposure to dust and with tuberculosilicosis either suspected or proved. Thirty of these patients were treated by medical means, some because surgery was not indicated and others because pulmonary function or a cardiac condition precluded surgical therapy. Eighteen patients received surgical therapy, but 4 [illegible] evaluated. The surgical procedures in 14 [illegible]th tuberculosilicosis were pneumonectomy in 1, bilobectomy in 1, lobectomy in 7, segmental resection or less in 4, and extraperiosteal plombage in 1. The authors conclude that surgical therapy can be applied successfully to some patients with active tuberculosilicosis. Patients with extensive disease, which requires a pneumonectomy or a bilobectomy, in whom the roentgenogram demonstrates extensive lymph node involvement near the hilus, can be expected to have poor results. Technical difficulties will be encountered in many patients with tuberculosilicosis; however, by careful surgical dissection, by peripheral and intrapericardial control of the pulmonary artery and pulmonary veins, these difficulties can be surmounted. Of the several complications that may occur in these patients, bronchopleural fistula is the most hazardous and most difficult to control. With a careful combination of medical and surgical treatment, a great proportion of the paitents can be expected to return to active and useful lives.

THERAPEUTICS

ACTH and Adrenal Steroids in the Treatment of Pneumococcal Meningitis in Adults. J. C. Ribble and A. I. Braude. Am. J. Med. 24:68-79 (Jan.) 1958 [New York].

In an attempt to reduce the hazards of exudative inflammation and hypersensitivity to pneumococcus, 7 men and 5 women, between the ages of 27 and 73 years of age, with pneumococcic meningitis were given bactericidal chemotherapy with corticotropin as a supplement. Penicillin in a dose of 20 to 30 million units daily was given usually in the form of a slow intravenous drip. Three patients were given part of the daily total dose intramuscularly in divided doses of 1 or 2 million units every 2 hours. All patients received corticotropin in doses of 40 to 120 units intravenously, 3 received hydrocortisone in doses of 150 to 200 units intravenously, and 1 received cortisone in doses of 50 to 150 mg. intramuscularly. Corticotropin was used in all patients to avoid the possibility of adrenal atrophy which may follow the use of cortisone and other adrenal steroids. Eleven patients (92%) recovered, and 1 patient died 18 hours after admission to hospital. Another patient died 6 months later of pneumonia and a brain tumor, but no residual evidence of meningitis was observed at autopsy.

Evaluation of the anti-inflammatory effectiveness of the steroids in these patients was difficult because of the simultaneous administration of penicillin, but the remarkable decrease in spinal fluid pressure, protein content, and cell counts in certain patients did not appear to be attributable to penicillin alone. It has also been difficult to establish the importance of steroids in protecting the patients from bacterial hypersensitivity, because reactions of this type consist of marked outpouring of leukocytes and protein in the spinal fluid as well as nuchal rigidity, headache, high fever, convulsions, and coma, which are identical with the clinical manifestations of pneumococcic meningitis. No serious deleterious effects of corticotropin therapy were noted in these patients. Adrenal steroids may be administered even to desperately ill patients with no increase in the incidence of untoward effects. The combined therapeutic regimen used in these patients would seem to deserve further trial.

19-Nor-17α-Methyltestosterone, a New Progestational Substance More Potent than Progesterone. F. E. Mansani. Minerva ginec. 9:935-941 (Nov. 30) 1957 (In Italian) [Turin, Italy].

Clinical investigations by the author on many patients with gynecologic and obstetric endocrine disorders have shown that 19-nor-17α-methyltestosterone is an effective progestational agent. Clinical results in 6 patients are discussed. One patient, single, 22 years old, with catamenial epileptic seizures ascribed to hyperestrinism, received this drug for 4 months. Symptoms of epileptic seizures gradually subsided, and no disequilibrium of the regular monthly menstrual periods was observed. The combined medication of 19-nor-17α-methlytestosterone and an estrogen artificially induced monthly menstrual periods in 2 patients; 1 of them was a single, 17-year-old girl, with primary amenorrhea associated with primary ovarian dysgenesis, and the other was a 36-year-old married woman, with secondary amenorrhea due to total hypoovaria. This drug produced arrest of metrorrhagia and restored the regular monthly menstrual periods in 2 patients, 1 of whom had menorrhea caused by relative hyperestrinism, and the other had menometrorrhagia and dysmenorrhea due to absolute hyperestrinism. The 19-nor-17α-methyltestosterone combined with a sedative therapy caused bleeding arrest and continuation of pregnancy in a primigravida woman, 20 years old, in whom abortion was likely to occur in the 4th month of pregnancy, due to severe hypoluteinism (hypoprogesteronism). As a progestational agent, 19-nor-17α-methyltestosterone has proved to be more potent than progesterone. The possibility of using the oral route and the administration of small daily doses (about 1 mg.) give this drug an advantage over progesterone and other progestational agents.

BOOK REVIEWS

The Aged in American Society. By Joseph T. Drake, Professor of Sociology, Davidson College, Davidson, N. C. Cloth. $5.50. Pp. 431. Ronald Press Company, 15 E. 26th St., New York 10, 1958.

This book is a welcome addition to the growing literature concerned with the various aspects of the problem of aging. Written from the social economic viewpoint, it makes an outstanding contribution in this respect. It is well written and contains much valuable information. As a source book, it should be very valuable. It presents the problems of the aging from every angle, a feat not accomplished in any previous book on the subject. The portion regarding the economic needs of aging persons is especially well done and timely. This book is highly recommended.

Psychosomatic Ophthalmology. By T. F. Schlaegel, Jr., M.D., Assistant Professor of Ophthalmology, Director of Research, Department of Ophthalmology, Indiana University School of Medicine, Indianapolis. With collaboration of Millard Hoyt, M.D. Cloth. $11. Pp. 523. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1957.

The author, with a background of psychiatry and clinical teaching and research in ophthalmology, has made an outstanding contribution in both fields. If the ophthalmologist takes to heart the many suggestions for diagnosis and treatment contained in this well written and well-documented book, it should be of great help to his patients. As the eye is often involved in patients who have psychosomatic difficulties, the book will be of interest to physicians, nurses, and those working in fields related to ophthalmology. Psychiatrists and psychologists should find valuable material to aid them in the management of their patients. Part 1 contains much data that clarifies later parts, particularly the chapters on the cause and diagnosis of psychosomatic and psychiatric conditions that affect the eyes. In part 2, dermatological and neurological conditions in which the eyes are involved are described briefly but clearly. In part 3, the psychosomatic conditions affecting the eyes are treated under their anatomic location, for example, the eyelid, lens, and uveal tract. In part 4, the ocular conditions that have no strict anatomic location, such as glaucoma and psychogenic disturbance of vision, are discussed. The chapters on glaucoma and injuries in this part should be read by every ophthalmologist who desires a clearer understanding of the traumatic neuroses and wishes to treat his glaucoma patients with greater understanding. Part 5 is a brief, illuminating discussion on the psychosomatic approach to treatment, but to derive full benefit from reading this book one should have read other works in the field of neurology, psychiatry, and psychosomatic medicine. Although in most cases it is not difficult to decide whether the patient needs mainly rest, ophthalmic treatment, or psychotherapy, referral of a patient to a psychiatrist is not always easily accomplished and should not be undertaken lightly or without good cause. The author disapproves of prescribing orthoptic and other treatment without reference to the cause of the patient's complaint. In chapter 21 there is a wise discussion of the doctor-patient relationship, the technique of interviewing and selecting patients for psychotherapy, and the pitfalls encountered. The author has made many excellent suggestions in regard to the management of surgical patients and blind persons. The bibliographies and index, combined with the clearly presented headings, should make this book of unusual value as a reference work. It is enthusiastically recommended for reading by all who have any contact with patients with ocular difficulties.

Cardiovascular Collapse in the Operating Room. By Herbert E. Natof, M.D., Assistant in Anesthesia, University of Illinois, College of Medicine, Chicago, and Max S. Sadove, M.D., Professor of Surgery, University of Illinois, College of Medicine. Foreword by Warren H. Cole, M.D. Cloth. $6. Pp. 197, with 15 illustrations. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5; 2083 Guy St., Montreal, Canada; Pitman Medical Publishing Company, Ltd., 45 New Oxford St., London, W. C. 1, England, 1958.

Interest in this carefully organized and well written book should encompass all physicians who share in the care of surgical patients. This monograph offers an exhaustive review of previous experience with all phases of cardiovascular collapse or cardiac arrest in the operating room. Analysis of published reviews is corroborated by personal statistical evidence. Particularly valuable is the section on the physiological mechanisms which give rise to cardiovascular collapse. Significant emphasis is placed on the role of multiple factors, such as hypoxia, hypercapnia, reflex mechanisms, and the toxic effects of anesthetic agents. The authors stress such preventive measures as the correction of anemia, hypoproteinemia, and hypovolemia before operation is considered. Failure to recognize the existence of cardiac or pulmonary disease, they caution, can be responsible for cardiovascular collapse. All members of the medical profession participating in surgical procedures, regardless of the functions they perform, should find this book of great value.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

QUESTIONS AND ANSWERS

USE OF ACTH FOR PATIENTS TAKING CORTISONE

To the Editor:—*Should a patient on long-term cortisone acetate therapy be given ACTH at regular intervals to stimulate the adrenals? If so, in what dosage and at what intervals should ACTH be given?* *M.D., Tennessee.*

Answer.—Although intermittent administration of ACTH has been widely advocated as a means of circumventing adrenocortical depression by cortisone and allied steroids, there is little or no clinical or experimental evidence to support such use of ACTH. Physiologically, adrenocortical depression by cortisone is a consequence of suppression of the output of adrenotrophic hormone by the anterior pituitary rather than a direct effect of cortisone on the adrenal glands themselves. Administration of ACTH cannot be expected to lessen the suppression of pituitary function by cortisone and may, indeed, aggravate it. It is therefore apparent that exogenous ACTH, through its stimulatory effect on the adrenals, would prevent or correct adrenal depression only while the ACTH was being administered and, possibly, for a short time thereafter. In clinical practice, it would seem wise not to rely on intermittent administration of ACTH as a means of avoiding problems which may be associated with adrenal depression by cortisone.

SAFETY OF SWIMMING FOR VERY YOUNG CHILDREN

To the Editor:—*Three small children living on a tropical island have been swimming since the age of 6 months. Since there are disturbing and conflicting reports on advisability of early immersion, taking into account the circulatory and respiratory apparatus of babies, please give an opinion as to the immediate and long-range effects or dangers involved.*

Leon Sheplan, M.D., San Juan, Puerto Rico.

Answer.—The various hazards that have to be guarded against by adults naturally must be watched for also in children, but the only danger that particularly threatens young children seems to be the pressure applied by adults. It is a common experience to see a boy shivering and quaking in the water while an ambitious father yells impatient instructions from the shore. About a year ago, an especially flagrant instance was much publicized in the newspapers as resulting in the death of a child who had been compelled to practice high diving. The dangers are noted by Reichert (*J. A. M. A.* 166:1701-1707 [April 5] 1957) as follows: "Especially in interscholastic and intercommunity championship games, with uniforms, parades, prizes, and publicity, and with the possibility of vicarious glorification of parent and school, the psychological responses of all concerned can be abnormal in many ways." When such pressure is absent, it must be assumed that the child's instincts and the parent's experience afford excellent guides in deciding what is pleasant, safe, and beneficial.

FRAGMENTATION OF HEART MUSCLES

To the Editor:—*An autopsy of the heart of a 15-year-old boy who allegedly died of electrocution showed fragmentation of the muscle fibers on some areas. The heart was the only part of the body autopsied. Flabby hearts may show cross fractures, or separations, and this is also seen in old persons and in patients with chronic sepsis, poisoning, chronic wasting diseases, and circulatory failure. Fragmentation is also found in a violent death and in intestinal obstructions. Can any other condition cause this type of fragmentation? There were no other abnormal findings, and the pathologist stated that this fragmentation was not particularly unusual in autopsy material in general. He also stated that, aside from this fragmentation and minor postmortem changes, the structures of this heart appeared well within normal limits. Wood claims that while this fragmentation is found there is no change in any surrounding tissues or any reaction of tissues, but it is thought that it could be due to the agony of death and that it might occur in a healthy heart if death is from hanging, strychnine poisoning or other forms of violence.* *M.D., Iowa.*

Answer.—Fragmentation of heart muscle is frequently observed in persons dying of toxemia or septicemia, but it is also found in those who die from sudden violence. Excessive and acute dilatation of heart muscle just prior to cardiac arrest may be the cause for the condition. At present, neither clinical nor pathological significance is attached to this phenomenon. Jellineck has described, in some cases of death caused by electricity, tearing of heart

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

muscle fibers. This process is always associated with small hemorrhages and, for this reason, cannot be mistaken for simple fragmentation of the heart muscle fibers.

Answer.—Two types of fragmentation of myocardial fibers are frequently encountered in postmortem material. Clean, transverse breaks at the intercalary disks are usually referred to as fragmentation and may be either post mortem and due to autolysis or ante mortem and due to sharp rise in intraventricular pressure (Karsner). The other type of fragmentation consists of irregular, oblique, transverse fractures of muscle fibers and is usually regarded as an artefact resulting from the process of preparing the tissue for histological examination. Overtreatment with xylene or other clearing agents, as well as overheating in the paraffin bath, may cause tissue to become unusually brittle and predisposes to fractures of muscle fibers. Frequently, no explanation can be found for the fragmentation observed in postmortem material. Thus, no particular significance could be attached to the finding of myocardial fragmentation in the young man referred to.

Answer.—Segmentation, or so-called fragmentation, of muscle fibers is a common finding in histological studies of adult hearts but is less commonly found in younger persons. Saphir and Karsner (*J. M. Research* 44:539, 1924) found segmentation and fragmentation in 41% of the hearts examined in routine autopsy material. The lesion was not limited to any single cause of death but was found in a great variety of conditions, many of which are mentioned in the question. Apparently, delay in doing the autopsy causes little effect due to postmortem changes. Segmentation occurs in hearts examined immediately after death, and most authorities believe that it develops usually in the agonal state. Saphir and Karsner produced marked segmentation of the myocardium of the left ventricles of rabbits by producing dilatation of the left ventricle by ligating the ascending aorta and of the right ventricle by ligating the pulmonary artery. Ligation of the aortas of three dogs and two cats was followed by histological changes similar to but not so marked as those in rabbits. Possibly, terminal agonal dilatation of the heart may produce the lesion in human beings. Severe physical strain is known to cause a sharp rise in blood pressure. Electrocution might have produced a convulsion resulting in elevation of aortic pressure and acute cardiac dilatation in the case in question. A complete autopsy, instead of examination of the heart alone, should have been done in order to obtain proper evidence on which to base reasonable conclusions.

CYSTITIS CYSTICA

To the Editor:—*A 61-year-old man, who has been under continuous observation since the onset of his illness early in 1954, has attacks of painful urination combined with frequency and urgency lasting for a few days at a time. The pain is not necessarily at the beginning or the end of urination but is throughout. At the onset, the interval between attacks was about seven weeks, but this has increased in frequency until, in the past six months, the attacks have come to be about a week apart. For the past 18-24 months, the patient has passed tissue in the urine. There is no pain when the tissue is passed; the pain begins a day or two before, that is, while the tissue seems to be separating, and the passage of the tissue terminates the attack. Frequency and nocturia are now present even between attacks. There has never been hematuria or a stone passed. In fact, routine urinalyses have all been negative (and acid), except on one occasion when the patient developed a purulent cystitis after a cystoscopy. This patient has had 11 cystoscopies, with 10 biopsies of the bladder and 1 punch biopsy of the prostate. All the examinations have shown the trouble to be in the bladder, which, on cystoscopy, has been described as being acutely inflamed, with multiple small cystic areas which started in a relatively small area of the posterior wall and have gradually come to cover the greater part of it. It has invaded the trigone but has avoided the ureteral openings. As yet, the bladder has not shown any real induration. All biopsy specimens have been reported as showing cystitis cystica, but every piece of tissue passed and findings in innumerable cytological studies of the urine have been reported as containing atypical cells which are probably malignant. In addition to the repeated urologic surveys, this patient has had numerous examinations, including frequent studies of the colon and rectum, roentgenograms of the entire spine, blood phosphatase tests, and repeated urine cultures. These have all been negative. There has been little treatment except for the continuous observation for cancer of the bladder. On one occasion, steroids were given with good results but had to be stopped because of recurrence of a duodenal ulcer. Is this patient's cystitis cystica related to his passing of tissue? Is there any indication for cystectomy of this nonmalignant condition of the bladder? Please advise on medical treatment for this condition.*

M.D., New York.

Answer.—Cystic changes in the mucosa of the bladder may be observed with a variety of mucosal lesions. While the condition known as cystitis cystica is observed most frequently, other inflammatory lesions may be attended by cystic changes in the mucosa. Most of these are caused by infections, though the causative organism may be difficult to isolate. Unusual forms of urinary infection may be observed in which cultures and smears of the urinary sediment are essentially negative. A condition known as cystitis glandularis is occasionally observed and may be accompanied by cysts and proliferation of the mucosa, as well as by the passing of tissue in the urine. With this condition, atypical cells suggestive of malignancy are sometimes found on biopsy. It is curious that, in the case under consideration, no attempt has been made to treat the cystitis by means of local measures, such as lavage of the bladder and fulguration of the areas involved. Among various solutions which might be tried with lavage is Clorpactin (monoxychlorosene), which recently has been used successfully in treatment of similar clinical conditions. Some patients with regional, panmural, and glandularis cystitis have been successfully treated by means of cystoscopic electrocoagulation. Various forms of antibiotic treatment might also be tried. It would seem that courses of treatment as suggested should be tried before cystectomy is considered.

SHOOTING PAINS

To the Editor:—*A 44-year-old man has complained of shooting pains present in his trunk, scapula, both hands, and both feet for one year. He is a diabetic whose condition is controlled by diet. He had been drinking heavily for many years until the onset of the above symptoms. Neurological examination revealed unsteady gait, poor balance on either foot alone, decreased position and vibration sense in the lower extremities, diminished tendon reflexes, and atrophy of the shoulder girdles and thigh. Spinal fluid examination showed normal pressure, normal manometrics, no cells, and protein level 123 mg.%, chlorides level 748 mg.%, and sugar level 117 mg.%. A repeated spinal tap three weeks later showed protein level 109 mg.% and no cells. The diagnosis has been virus encephalomyelitis, but he has not responded to therapy with thiamine, vitamin B_{12}, and ACTH. The pains have decreased but not disappeared. Please suggest a therapeutic measure to help this patient.*

M.D., New York.

Answer.—The diagnosis of virus encephalomyelitis does not rest alone on the albuminocytological dissociation. Increase of protein level without an associated increase in number of cells may occur in obstructive processes within the spinal canal. If the constriction is in the cervical area, manometric block does not always follow the rule as it does elsewhere, due to the elliptic shape of the canal and its anterior ridge leaving grooves on each side for spinal fluid to transmit the results of jugular compression. The level of the atrophy around the shoulder girdles in this patient suggests the need for careful stereoroentgenographic study of the cervical spine and perhaps a myelogram. The loss of reflexes and even atrophy of the lower extremities can occur in certain gross cervical lesions. In the case described, the spinal fluid chlorides level is also increased, as is the sugar factor. Virus encephalomyelitis (Guillain-Barré syndrome, infective neuronitis) is usually a part of a widespread involvement of the spinal roots and nerves. It is usually preceded by a recognizable upper respiratory infection and should clear under the treatment noted in the question. Obviously, as this has not occurred, the part that the alcohol and diabetes may play in this instance cannot be overlooked. Some of the findings may be altered by a toxic overlay. Virus infection and bacterial allergy can also simulate this condition by causing an epidural thrombophlebitis of the meningorachidian veins. If the cervical x-rays prove negative for osteoarthritis, narrowing of the canal, or other focal processes that deviate from the normal, then clearing up of all oral or dental infection and cultures of the mouth and gums for Streptococcus viridans (alpha prime) with an autogenous vaccine, prepared and administered in ascending doses, often goes far toward control of pain and desensitization.

DELAY IN CLAMPING THE UMBILICAL CORD

To the Editor:—*What is the rationale of the theory that there may be a relationship between delay in clamping of the umbilical cord and icterus neonatorum?*

M.D., Illinois.

Answer.—Full-term newborn infants frequently receive an autotransfusion of cord blood, ranging from 75 to 100 cc., due to late clamping of the cord, i.e., after the cord has stopped pulsating, or due to manual clamping of the cord. Under ordinary conditions in the otherwise hematologically normal child, this will produce no serious defect. It is theoretically possible, however, that in the premature infant or in the infant with subsequent erythroblastosis fetalis the additional infusion of red blood cells will account for an additional amount of bilirubin, due to hemoglobin destruction. The great problem with the presence of bilirubinemia in the newborn infant is primarily based on the fact that in the newborn infant and, especially, in the premature infant the liver is markedly deficient in an enzyme (transferase) necessary to conjugate bilirubin. This produces a marked increase in amount of bilirubin, or so-called indirect acting bilirubin, in the infant's blood, with subsequent possible production of kernicterus. In the mature infant or one or 2-week-old child, the liver has sufficient transferase to allow for conjugation of bilirubin. This type of bilirubin does not allow kernicterus to develop. It would seem, therefore, that the only problem with late clamping of the cord would come about in the premature infant whose transferase activity was extremely low and would not develop for some period of time or in the infant who might develop a hemolytic disorder due to Rh or other blood-group incompatibility.

DIFFICULT URINATION IN INFANT

To the Editor:—*An 8-month-old boy was given antispasmodic drugs at the age of 3 weeks because of periodic irritable crying simulating that seen in "colic." Until the age of 4 months, the child was taking 7.5 mg. of dicyclomine syrup three times daily. At that time, there was first noted urinary straining, diurnal infrequency, and inability to void while asleep for as long as 12 hours. The urinary meatus, bowel habits, neurological status, and urinalyses were normal. Warm baths stimulated voiding with good stream and produced minimal but definite straining. Except for occasional lapses, the child was not permitted to sleep for more than six hours without voiding. When the child was 5 months old, intravenous pyelograms showed a small bladder and normal upper urinary tract. Passage of a ureteral catheter into the bladder without difficulty was believed to indicate absence of significant urethral stricture. Urinary straining and inability to void when asleep have persisted until the present time. Straining has become more frequent recently, after a three-week period of what seemed to be slight improvement. Has any similar instance of chronic urinary difficulty after the prolonged use of antispasmodic drugs in infants been reported? Has "spastic" urinary sphincter been observed in infants without neurological disease?*

M.D., New York.

Answer.—Although a ureteral catheter was passed without difficulty into the bladder, further study is indicated. Residual urine should be tested or followed by cystoscopy and direct examination of the urethra for such anomalies as urethral valves or some bladder neck obstruction or dysfunction. No case has been observed in which dicyclomine caused difficulty in urination, although this has occurred with methantheline bromide. The difficulty may subside spontaneously or with discontinuation of the medication. No infants have been observed with "nervous spasm' of the external sphincter, but this has been seen in older children.

RETINAL DETACHMENT IN BOXERS

To the Editor:—*What is the incidence of retinal detachments among professional boxers?*

Ralph T. Sproule, M.D., Milwaukee, Wis.

Answer.—An accurate record of the incidence of retinal detachment in professional boxers is difficult to obtain. There is a paucity of past or current literature on this serious eye complication. Six cases of retinal detachments were observed among professional boxers in the past two years in New York State. About 2,000 boxers participated in boxing contests during this period, but only 900 were examined and licensed in New York State during this time. It would appear that retinal detachment among professional boxers is becoming more frequent, but this observation may be more apparent than real, since visual acuity tests, ophthalmological examinations, and consultations are now more frequently performed as a routine requirement of the boxer's medical examination than in the past.

ANIMAL AND VEGETABLE FATS

To the Editor:—*Please give information concerning the content of animal and vegetable fats in margarine and shortenings. Do they contain any large amount of beef and pork fat? Is there no law which orders producers to state the composition of the packages? It is important to know the content of these foods in order to give patients the right diet orders.*

Arthur Samuel, M.D., Chenoa, Ill.

Answer.—According to the figures of the U. S. Department of Agriculture, more than 99% of the fats used in the manufacture of margarine come from vegetable sources, with cottonseed oil and soybean oil being used in 94% of the margarine, plus small amounts of peanut oil, corn oil, and other vegetable oils. Vegetable fat shortenings may be of the compound, blended, all-hydrogenated variety. In the manufacture of the compound variety, liquid oils are adjusted to the proper consistency by the addition of highly hydrogenated oil. The all-hydrogenated shortenings are made by hydrogenating all of the oil, at least partially, and adjusting to the proper consistency with small amounts of completely hydrogenated oil. They have a lower iodine content and, consequently, are more stable than are the blended shortenings. Examination of the label should tell what type of product is being purchased. While the specific vegetable oil will not be indicated on the label, it will be indicated as to whether it is entirely from vegetable sources.

EGG SHELLS AS A SOURCE OF CALCIUM

To the Editor:—*Please comment as to whether the calcium from egg shells, after the eggs are put through a food blender, is in a form which is of use to the human being. How much use could be derived from such a product?*

M. C. Florine, M.D., Janesville, Minn.

Answer.—Egg shell is largely composed of calcium carbonate, with magnesium and other metals in smaller quantities. Analytical values are as follows: calcium carbonate, 93.7%; magnesium carbonate, 1.39%; phosphorus pentoxide, 0.76%; and organic matter, 4.15%. Calcium carbonate is almost entirely converted into soluble calcium salts in the digestive tract. Therefore, egg shells processed through a food blender would serve as an excellent source of dietary calcium. It must be remembered, however, that in order for calcium to be useful to the body it is necessary that vitamin D and phosphorus also be present. It should be remembered, too, that the egg shell may not be the cleanest food in the world.

TETRACYCLINE THERAPY

To the Editor:—*Is it permissible to mix ACTH or hydrocortisone succinate with tetracycline hydrochloride? It is permissible to mix tetracycline in 5% dextrose solution for intravenous administration?* *M.D., West Virginia.*

Answer.—It is usually unwise to mix ACTH or hydrocortisone succinate preparations with tetracycline. If no precipitate is formed in the mixture it would be safe to inject these together, but, since they are often buffered to a definite pH, there is always the possibility of precipitation, particularly of a polypeptide, such as ACTH. There is no contraindication for mixing tetracycline prepared for intravenous use with 5% dextrose solution.

SPICULE OF FINGERNAIL

To the Editor:—*Occasionally, after the healing of traumatic amputations or other less mutilating injuries of the fingertips, a small spicule of fingernail regrows in a displaced position, thereby causing much subsequent annoyance to the patient, such as when it catches on clothing. Is there any method other than that of open surgical intervention of destroying the dislocated fragment of matrix from which this detached offshoot develops?* *M.D., California.*

Answer.—When a small spicule of fingernail regrows in a displaced position, the only known method of adequate treatment is surgical intervention to destroy the dislocated fragment of matrix.

VAGINAL BLEEDING

To the Editor:—*Would protein-bound iodine determinations be of help in determining the cause of vaginal bleeding? If so, why?*
Samuel Newman, M.D., Danville, Va.

Answer.—Disorders of menstruation, such as amenorrhea or menorrhagia, often are complications of thyroid disorders. Women with functional uterine bleeding in whom a low protein-bound iodine level is demonstrable may respond most dramatically to thyroid medication. In all patients with abnormal vaginal bleeding, uterine malignancy, cervical polyps, and incomplete abortion should be ruled out before resorting to hormonal treatment.

CYSTIC DISEASE OF THE BREAST

To the Editor:—*In the question and answer concerning a 35-year-old patient with a combination of bilateral cystic disease of the breasts and polypoid endometrial hyperplasia (J. A. M. A. 166: 1535 [March 22] 1958), the consultant neglected to mention hysterectomy and bilateral oophorectomy as possibilities in the treatment. This patient presents abnormalities in two end organs affected by estrogen, the breast and the endometrium. As a result of bilateral salpingectomy for salpingo-oophoritis, she has previously been rendered sterile. Studies of ovaries involved in such inflammatory processes have revealed persistent oophoritis, formation of cystic follicles, inflammatory cysts, and premature senescence (Hertig). The polypoid endometrial hyperplasia is, in all probability, due to long-standing estrogen stimulation of the endometrium without cyclic ovulation. There is also evidence that this hormonal "milieu" may be a predisposing factor in endometrial carcinoma (Sommers and Hertig). The mastodynia may be secondary to the same persistent estrogen stimulation. Furthermore, Haagenson has presented data suggesting that, in women with clinically evident, proved gross cysts of the breast, the incidence of subsequent breast carcinoma is greater than in women in the general population. Yet he does not believe the risk to be great enough to warrant prophylactic mastectomy. There is also suggestive evidence that the incidence of mammary carcinoma is lower in women who have had bilateral oophorectomy. Herrell found that only 1.5% of women with breast carcinoma had had their ovaries removed earlier in life, while 15.4% of a control series of women not having breast carcinoma had had bilateral oophorectomy. In view of these suggestive data, it would seem that this patient would be best treated by total hysterectomy and bilateral oophorectomy. This would spare her the cosmetic mutilation of bilateral mastectomy and prevent further menorrhagia. Mastodynia is almost always improved by bilateral oophorectomy, and symptoms of surgical menopause may be controlled by intermittent oral administration of estrogens in small doses. Finally, when pelvic inflammatory disease is extensive enough to warrant bilateral salpingectomy, optimum results are obtained by total hysterectomy and bilateral salpingo-oophorectomy. Unfortunately, numerous hysterectomies are performed for indications of much less importance than those presented by this patient.*

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WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Three-year Hill-Burton Extension . .
National Health Survey on Injuries . .
Milk Sampling for Radioactivity . .
Appointments to Advisory Research Councils . .
Hearings on Water Pollution Control . .

SUBCOMMITTEE PROPOSES THREE-YEAR EXTENSION OF HILL-BURTON

The first major step in continuing the Hill-Burton hospital construction act has been taken. The health subcommittee of the House Interstate and Foreign Commerce Committee recommended to the full committee a three-year extension of the act beyond June, 1959. That is the date the act expires unless Congress extends it. To allow for orderly planning, Hill-Burton officials need to know well in advance whether the program will be continued.

Chairman John Bell Williams (D., Miss.) points out that, while the subcommittee heard a variety of proposals for amendments, it was the belief of the members that a simple extension would have the best chance of getting through this year. This does not preclude the subcommittee offering other amendments to the act, but they would be handled as separate pieces of legislation, according to Mr. Williams.

A few days later, the subcommittee approved another bill by Mr. Williams authorizing for the first time low interest loans under Hill-Burton. The recipient would have to meet all the requirements of an applicant for a grant.

The American Medical Association in testimony to the Williams group last month supported extension of Hill-Burton and urged new emphasis on facilities for the chronically ill and for nursing homes, as well as modernization of older hospitals.

At that time the Association witnesses, Drs. Julian Price and Willard Wright, also recommended a program for federal guarantee of proprietary nursing home mortgages.

The A. M. A. also wants categorical grants eliminated and single appropriation substituted for all eligible facilities. This would make it easier for the states to utilize funds.

HEALTH SURVEY DETERMINES INJURY RATE

The U. S. National Health Survey has been busy figuring how many Americans are injured seriously enough to require medical attention or to limit their activities for at least a day, and the frequency of such injuries.

During the second half of 1957, the Public Health Service–sponsored survey showed there were 24,953,000 such persons. Their injuries resulted in almost 214 million days of restricted activity, including 55,500,000 days spent in bed at home or in the hospital.

Home accidents injured 10,065,000, or 40.3% of all involved; work accidents accounted for 4,173,000, or 16.7%; motor vehicle accidents injured 2,444,000, or 9.8%; and other kinds of accidents and injuries resulting from violence involved 8,267,000, or 33.1%.

During the period surveyed, PHS found that on average about 1,175,000 persons every day were limited in their activities, and 305,000 were in bed either in or out of a hospital. Considerably more were males, 14,100,000, as against 10,800,000 females; 14,900,000 were urban residents; 7,100,000 were residents or rural-non-farm areas; and 3 million lived on farms.

Figures are preliminary and are subject to possible revision when statistics have been gathered for a longer period of time.

PHS TO SAMPLE MORE MILK FOR RADIOACTIVITY

The Public Health Service is expanding its network of sampling areas in a continuing study of the radioactivity of milk. It is adding six milksheds serving Atlanta, Ga.; Fargo, N. D.; and Moorhead, Minn.; Austin, Texas; Spokane, Wash.; and an area in southern Wisconsin.

PHS recently made public a sampling study in milksheds serving Sacramento, Calif.; Salt Lake City; St. Louis; Cincinnati; and New York City. Milk samples were analyzed for specific radioisotopes, including strontium-90, which is taken up by the bones after entering the body. The PHS found samples well below the permissible limits agreed on by the National Committee on Radiation Protection and Measurement.

This committee has set the permissible concentration of strontium-90 at about 80 micromicrocuries per liter. The PHS reported that values found in the study varied from 3.4 to 7.4 micromicrocuries per liter, or a range from 5 to less than 10% of the maximum permissible. A micromicrocurie is one-millionth of a millionth of a curie. Other radioactive elements, such as barium-140 and cesium-137, were even lower relatively in permissible levels.

The pilot study is part of PHS's program of environmental analysis of radioactivity in water, air, and food. Milk was chosen for the initial study, according to PHS, since it is among the most important foods and because it is produced throughout the year in all sections of the United States.

"The study is developing simple and efficient sampling methods and improving analytical techniques so that state and municipal health agencies and the dairy industry eventually can perform their own analysis," PHS said.

APPOINTMENTS TO NATIONAL ADVISORY RESEARCH COUNCILS

A number of appointments and reappointments have been made to the advisory councils for the various National Institutes of Health. The councils recommend the particular grants to be made by the institutes to nongovernment individuals and organizations, subject to approval by the surgeon general. Some of the appointments are effective immediately, others not until later in the year. The complete list:

Allergy and Infectious Diseases—Mundey Johnston, Tucson, Ariz.; Dr. Gordon Meiklejohn, University of Colorado Medical Center, Denver.

Cancer—Dr. Murray M. Copeland, Georgetown University Medical Center, Washington, D. C.; Dr. Charles A. Evans, School of Medicine, University of Washington, Seattle; and Dr. R. S. Schreiber, the Upjohn Company, Kalamazoo, Mich.

Heart—Dr. E. Cowles Andrus, Baltimore; and Mrs. Albert D. Lasker, New York.

Mental Health—Marquis Childs, Washington, D. C.

Arthritis and Metabolic Diseases—Dr. Charles H. Burnett, University of North Carolina School of Medicine, Chapel Hill; Dr. Carl V. Moore, Washington University School of Medicine, St. Louis; and Dr. Charles Regan, College of Physicians and Surgeons, Columbia University, New York.

Neurological Diseases and Blindness—Dr. Francis M. Forster, Georgetown University School of Medicine, Washington, D. C.; Dr. Clinton N. Woolsey, University of Wisconsin, Madison; and Dr. Jacob Yerushalmy, University of California School of Public Health, Berkeley.

Dental—Dr. Harold L. Enarson, University of Colorado, Boulder; Dr. Willard C. Fleming, School of Dentistry, University of California Medical Center, San Francisco; Dr. R. S. Poor, J. Hillis Miller Health Center, University of Florida, Gainesville; and Dr. Robert L. Sutherland, University of Texas, Austin.

National Advisory Health Council—Dr. H. Stanley Bennett, University of Washington School of Medicine, Seattle; Dr. Sidney Farber, Children's Cancer Research Foundation, Boston; Boisfeuillet Jones, Emory University, Georgia; and Dr. Arthur Kirschbaum, Baylor University College of Medicine, Houston, Texas.

PRESIDENT URGES SUPPORT FOR POLIOMYELITIS VACCINATION CAMPAIGN

For anyone not to receive protection from Salk poliomyelitis vaccine "is to take unnecessary risks of lifetime disability and even death," President Eisenhower declared on receiving a report on the first year of the campaign to promote use of the vaccine. He said the effort had his "hearty endorsement," and added, "I know this campaign will help the physicians, health officials and community leaders who are now mobilizing local drives and clinics."

The drive for sustained, year-round use of the vaccine is an undertaking of the American Medical Association, the National Foundation for Infantile Paralysis, and the U. S. Public Health Service. The report was made to Mr. Eisenhower by A. M. A. President David B. Allman; Basil O'Connor, head of the poliomyelitis foundation; and Dr. Leroy E. Burney, PHS surgeon general. Their report noted that, in addition to efforts of the three organizations, the Advertising Council currently is conducting a nationwide advertising campaign to stimulate interest in the vaccine.

In the last four years 64,500,000 Americans 40 years of age and under have received one or more injections, which the report calls "a spectacular achievement." The PHS estimates that a million persons are reporting for an injection each week. "However," the President was told, "among the 111 million persons under 40 years, only 49 million have received the full course of three injections, and 46.5 million have received none. Many of the unvaccinated are children age 5 and under who are especially vulnerable to attack by this killing and crippling illness."

The report points out that manufacturers now have 27 million doses on hand, and there are other millions in physicians' offices and drug stores.

PROPOSALS FOR INCREASING WATER POLLUTION CONTROL FUNDS

The long-standing debate of federal versus local responsibility has arisen again in Congress. This time it centers around proposals to broaden the Water Pollution Control Act passed two years ago. Proponents want the annual appropriation of 50 million dollars doubled, authority given the surgeon general to shift unused allocations from one state to another, and a doubling of individual grants for waste treatment projects to a maximum of $500,000.

Bills are before the rivers and harbors subcommittee of the House Public Works Committee; its chairman is Rep. John Blatnik (D., Minn.) who is sponsoring one of the bills and led the drive in 1956 to get the act passed.

The administration objected to the proposals on the grounds that the Joint Federal State Action Committee has proposed that water pollution control be fully turned over to the states in return for the transfer of telephone excise taxes from the federal government to the states. With this in mind, Assistant Health Secretary Elliot Richardson told the subcommittee that none of the proposals is "of such urgency or importance as to warrant enactment for the one-year period remaining until the program's termination as recommended by the President."

Many committee members, particularly the Democrats, did not agree with this position, nor did a number of other witnesses. Senator Humphrey (D., Minn.), the first witness, said it was imperative that Congress continue to consider the question of water pollution as "something transcending county and state lines." He said that if "any such scheme for transferring telephone tax revenues in exchange for state jurisdiction over the sewage treatment works grant program were to be authorized, the very states which most need additional sewage treatment works might well be the states receiving the least amount of tax revenues from this source."

Other members of Congress appearing in support of more federal money in this field were Representatives Brent Spence, chairman of the House Banking and Currency Committee, and Melvin Price